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THE

DENTAL RECORD:

A

MONTHLY JOURNAL

OF

DENTAL SCIENCE, ART, AND LITERATURE.

DEVOTED TO THE INTERESTS OF THE PROFESSION.

EDITED BY

THOMAS GADDES, L.D.S.ENG. AND EDIN.

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THE

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PREFACE.

It has been decided to publish and issue on the 1st of each month, a Periodical to be entitled "The Dental Record." With this, the first number, is The Dental Record established, and it will be carried on as a free and independent Journal.

Its pages are open to all contributions possessing literary merit, and to correspondence on topics of interest to the Dental Profession. It is, and will continue to be, independent of any political party or society.

The educational advancement of a body is always associated with the development of its literature. The Dental Record is the outcome of this advancement, and is necessitated by the spreading influence of Dentistry as a Profession. It will offer every facility for the publication of matters of interest to the profession, and thus give a stimulus to men to write and communicate the results of their research and experiences, and their opinions.

There will be given Notices and Illustrations of New Inventions, both in Operative and Mechanical Dentistry; also information relating to all that is new.

The Reports of Societies, the Reviews of Books, and Notices of other Literature appertaining to Dentistry, will find a place in the pages of The Record.

Annotations of general *Dental* and *Science Gossip* will receive special attention.

A page will be set apart for *Intercommunications*—for asking and answering questions as to modes of practice, &c.

Space will also be given for *Exchanges*. Under this heading will be mentioned articles for barter, but not for sale.

These latter are new features in a Dental Journal, which, together with a sufficiency of matter of scientific and literary value, will, it is hoped, ensure The Dental Record a welcome to the house of every English reading Dentist.

CASES OF FACIAL NEURALGIA.

BY JAMES STOCKEN, L.D.S.Eng.

WHEN we consider the composite character of the tooth pulp, and the conditions of its existence, it is not surprising that we should so often find it in a state of disease, and causing, directly or indirectly, attacks of that sad calamity neuralgia. In a general way, we may assert that whatever interferes or modifies the blood supply and nerve function, must check the process of nutrition, and consequently bring about a pathological condition. In the words of Dr. Green, "*Nutrition* consists in the continuous supply of new material, the separation of this from the blood, and its appropriation by the tissues, together with the removal of the products of their waste. *Function* is the special manifestation of the life of the part, as distinct from its growth and the maintenance of its structure; in the secreting cell, consisting in the alteration of the substance abstracted from the blood to fulfil some special purpose in the economy; in nerve, the transmission of impulses of motion and sensation, &c. The performance of function is obviously dependent upon the state of nutrition."

The circumstances conducing to a pathological condition are many; thus, an abnormal condition of the blood—the blood normal but the supply deficient or in excess—obstructions, either in the arteries, veins, or capillaries—diminished cardiac power—traumatic and chemical agencies, &c. These are some of the causes leading to a morbid state, and that condition may be manifest either in irritation, inflammation, fatty degeneration, calcification, atrophy, gangrene, neuralgia, &c.

When we read such a list of diseased conditions, it should lead us to inquire how far we can grapple with them in their incipient forms, and thus arrest their progress before reaching such a consummation.

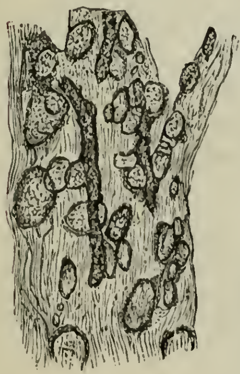
Two very exceptional cases of neuralgia have recently come under my observation. The first case, one of eight years' duration, is that of a patient about 60 years of age. When first attacked she was in a very debilitated condition through fatigue and anxious watching of a sick friend. In a moment she was seized with an acute paroxysm of pain darting through the left side of the tongue, and as quickly passing off, but returning seven or eight times during the same day. The pain seemed to originate between the left temple and the ear. The paroxysms continued through the whole summer, ceasing during the winter; the tongue becoming covered with large, red, irritable pimples, and subsequently turning scaly. During the attacks, which generally lasted from five to ten minutes, that side of the face became sadly distorted, eating or speaking often inducing an attack. In March of the second year she had a return of the paroxysms, a sudden and very acute pain darting from the left temple to the left side of the tongue—the latter becoming swollen and thickly coated with white fur. The paroxysms entirely ceased in September and during the winter months. She was treated homœopathically, no benefit resulting. In March of the third year the painful symptoms returned, of a similar character to those of the preceding two years. Homœopathic remedies, including apis and lachesis, gave partial relief; subsequently, electricity applied along the course of the nerves gave considerable relief, the pain ceasing altogether in August. Again, in March of the fourth year, the pain returned with increased severity—tongue much swollen and coated, speech interrupted. Electricity was applied, but without the least beneficial results. Pain again ceased in August, but contrary to previous years, returned in November and continued through the winter. The symptoms became more acute, and the paroxysms more frequent; mastication was rendered almost impossible, the smallest particle of food touching the left side of the tongue causing a paroxysm of pain. This condition of things continued until about May of the fifth year, when upon the application of "Neuraline" all the acute symptoms lessened in intensity, and ceased altogether in two days. About March of the sixth year there was a return of the symptoms, pain sometimes being felt over the whole of the left cheek, at other times commencing in the ear and proceeding thence to the tongue, the external meatus becoming quite dry, and accompanied by partial deafness. Neuraline and electricity were again resorted to, but without affording the slightest relief. The pain ceased in September after a sea voyage. In the early part of the seventh year the pain again returned, chiefly affecting the ear and tongue—the latter being much swollen, and, in the words of my patient, "a fine spray of water issuing from it." The pain continued more or less all through the year and following winter. In November, 1879, that is the eighth year, she came to me. She told me she had consulted several medical men, and had tried all kinds of remedies. The few teeth she had were apparently in a normal condition; there was no evidence of non-erupted wisdom teeth: in fact, she expressed herself perfectly certain they had been removed. I could scarcely look upon the case as coming within my province, but as her relatives were very old friends of mine, and having been asked by them to "try what I could do," I prescribed her gelsemium and aconite. She immediately derived relief, and from that time to the present—a period of eighteen months—she has been almost entirely free. Occasionally she may have a slight twinge of pain, which is at once relieved by a dose of the medicine. I may observe that during these long years of suffering, she was always free from pain at night, and her day attacks were always relieved upon assuming a recumbent position. Her friends and relatives informed me that during the paroxysms her features were so distorted that it was most distressing to be with her; moreover her life was becoming quite a burden, she being afraid either to speak or to eat. This patient has never worn artificial teeth.

There is one feature about this case—the affection of the ear, in conjunction with the "spray of water from the tongue"—which calls to mind the remarks of Dr. T. H. Green, in the introduction to his work on "Pathology and Morbid Anatomy." He says, "The influence of the nervous system must be taken into account in considering abnormal conditions of nutrition and function. This, by regulating the circulation and supply of blood, must to a certain extent control tissue-change. The results of experimental and clinical observation render it exceedingly probable that many nerves also contain fibres which exercise a direct influence upon nutrition, independently of that which is due to their vaso-motor filaments. In support of this view may be adduced the well-known observations of Ludwig and Heidenhain on the influence of the *chorda tympani*, on the *secretion of the submaxillary gland*, which prove the increased secretion which results from the stimulation of this nerve is due to an increased activity of the secreting elements of the gland, and not to changes in the blood vessels. Recent histological researches . . . are tending to show . . . that the nutrition not only of muscle and glandular organs, but of many other parts, is more or less under the *direct* influence of the nervous system."

The second case is that of a lady about the same age as the patient whose special history I have just described. She came to me in April last, and informed me that in January of this year, while eating, she suddenly felt an acute pain on the right side of the lower jaw. It was only of a moment's duration, but the attacks returned, and, from that time to the present, have continued with more or less acuteness. Prior to this she had been suffering with sickness. The patient is of a rather plethoric habit, has been most abstemious, and has some kidney mischief. In April her attacks had assumed a more severe form; she had been under medical treatment, but derived little or no relief, having taken among other things tonga, gelsemium and aconite. The symptoms may be thus described:—the pain is unilateral, exceedingly sudden in its access, and when very acute lasting only a minute or two, but, when less acute, of longer duration. The pain plays around the mouth and the ear. Eating and talking, also blowing the nose, will induce an attack of pain. The face is slightly tender where the pain is felt. In the earlier period of her attacks she always found relief by lying down, and at night was always free from suffering. But now the paroxysms are so severe as almost to deprive her of her reason, and are felt at night as well as in the daytime. Upon her visit to me in April a most careful examination of her remaining teeth led to the discovery of *superficial* caries in the canine. The tooth was not tender on percussion, was quite firm, and gave no evidence of periosteal irritation. I removed the tooth, and with its removal all her distressing symptoms subsided—but, two days afterwards, I received a letter to say her condition was not improved, the distressing symptoms had returned with the same severity. Since then she has again been three weeks under medical treatment, and now writes to the effect that, though somewhat better after the course of medicine and blistering, she had had a severe attack of periostitis of her remaining four or five front teeth, which became loose for four days, acutely painful, and she again had the same difficulty in eating and talking.

This patient had worn artificial teeth (entire upper and partial lower, both of vulcanite base) for many years, and she does not experience any discomfort or difference, whether she wears them or not.

The right lower canine tooth was extracted, and, having split it open, the pulp was examined. It presented an unusual pathological condition. The whole pulp was markedly anæmic, pale and shining, there being only a small portion at and near the apex which had any approach to vascularity. A little piece of the coronal part of the pulp was teezed out in glycerine upon a slide, and examined with the microscope. The accompanying engraving illustrates very faithfully the extent of calcareous degeneration which had taken place. Numerous calcified masses are isolated and also aggregated together. Some of them are large, while others are minute. Three pieces of blood-vessel are to be seen, but these have become obliterated by the deposition of calcareous matter in their walls: their outline, when highly magnified, being nodular and highly refracting. There is a notable diminution of protoplasm.



The degenerate condition of this pulp was quite sufficient to give rise to the acute suffering which the patient endured ; and though no permanent relief followed the extraction of this tooth, there can be no question as to the good practice of removing one or all of the few remaining teeth, on the assumption that calcareous degeneration has likewise affected them.

The initiative cause of this form of degeneration is undoubtedly an altered nutrition ; but whether that arises from an abnormal condition of the blood, an imperfect supply of blood, or a defective assimilative power of the protoplasm, are questions of the first importance, and lie at the root of a perfect knowledge of such disease.

A LECTURE ON OPERATIVE DENTAL SURGERY AND THERAPEUTICS,

Delivered at the National Dental College,

BY W. FINLEY THOMPSON, M.D., D.D.S.

THE sympathetic relation of the teeth to adjacent structures, and the medium through which disease may be transmitted to, or associated with other portions of the body, make it necessary to ascertain as accurately as possible the succession of morbid manifestations, and their connection with antecedent and existing causes, before any rational basis can be formed for the application of therapeutic remedies. These morbid phenomena are especially conspicuous and often difficult of interpretation in facial neuralgia, and in the absence of other apparent incentives, the teeth are naturally suspected. When caries cannot be found, enquiry should be made into the previous history of the patient's health, whether suffering from any constitutional disturbance, recent or remote, also as to medicinal treatment employed, mercurial or otherwise,—as these have a marked tendency to mislead in obscure forms of disease. Failing, however, to obtain satisfactory information, the trouble may be surmised as originating from one of two causes, viz., intrinsic calcification of the pulp, or an osseous formation on the root, called exostosis.

The teeth are sometimes affected by the mechanical irritation of calcifying bodies within the pulp—endostosis—and the calcification of the periosteum—exostosis—,conditions which frequently cause neuralgia in various organs and regions.

In the first—endostosis,—the usual symptoms augment without any clearly defined indication, until they simulate those of exostosis. When this occurs, no outward cause of pain can be discovered ; but, if an examination of the tooth be made after extraction, nodules and tubercles of secondary dentine will be found in the nerve canal, acting as an irritant by pressure upon the pulp.

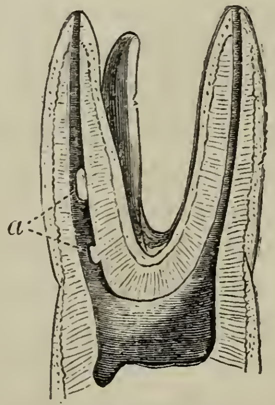


FIG. 1.

Enlarged diagram (split section) showing at *a* tubercles or nodules of secondary dentine.

In other instances, the development of secondary dentine manifests itself as granules interspersed throughout the substance of the pulp. If the nerve canal be found closed with osseous formations, the cause of trouble will probably be at the apex of the root; and the hope then of successful treatment must lie in its excision through the alveolus, or, as a last resort, the tooth may be replanted. These operations have been described in detail in a previous lecture.

The difficulties to be contended with in the extraction of teeth affected by the kindred form of disease—exostosis—are shown in the diagrams, which are drawn from specimens in my possession.

Exostosis is a hypertrophied condition of the cementum, developed from, and intimately connected with, the periosteal membrane. It may be described as nodular and diffuse. The former type consists of isolated, circumscribed masses upon the roots of teeth that, outwardly, present no marked indication of disease. The diffuse type is most conspicuous on teeth which have long been affected with caries (fig 2). Crownless roots, however, are also subject to this increase in their dimensions.

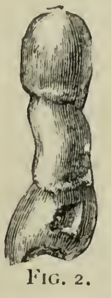


FIG. 2.

The two types of this disease not infrequently run into one another, and, by intermingling, lose their distinguishing character·

In the former, the physical manifestation may be very prominent, yet occasion but little suffering; or pain may be deeply seated and neuralgic in character. In the diffuse type, the pain is usually more lancinating than in the nodular, hypertrophy causing a tubercle or bulb-like formation on the fang, as shown in figs. 3 and 4. This may extend equally in all directions, until it enlarges the alveolar process, absorption of that tissue being so nearly equivalent to the increase, that physiological change goes on almost imperceptibly.

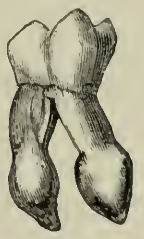


FIG. 3.

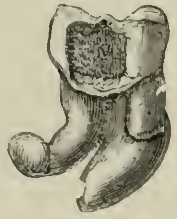
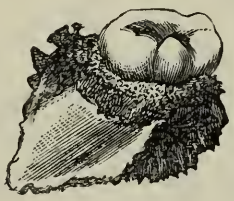


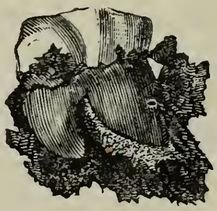
FIG. 4.

The opinions given by various authors as to the dangers of exostosis, and as to the pain caused, conflict. In the earlier stages it seems to occasion little, or no inconvenience; but an instance is given where a patient had "suffered fourteen years with fistulous openings in the left cheek," osteo-sarcoma having been induced by enlargement of the fang of the dens sapientia, which occasioned the loss of a great part of the maxilla.

The roots of several teeth are sometimes united, and so complicate extraction that a large portion of the alveolus accompanies the tooth. Laceration of the gum is perhaps more to be dreaded than loss of the process; for, unless fracture be so extensive as to endanger the firmness of adjacent teeth, its removal may be considered as only anticipating the absorption which naturally follows extraction.

A case of alveolar fracture is exhibited in figs. 5 and 6 (third molar), periosteal excitation having, by adhesive inflammation, developed a condition commonly called anchylosis; yet there is wanting an authenticated case of true anchylosis of cementum and socket. An example is more perfectly shown, perhaps, in fig. 12, where the teeth seem to have become solidly united. Atrophy and hypertrophy, in figs. 5 and 6, have simultaneously affected the roots of the tooth; the wasting process vertically being accompanied by lateral expansion. The former is the buccal, and the latter the lingual view, as shown after extraction.


Buccal view.
FIG. 5.


Lingual view.
FIG. 6.

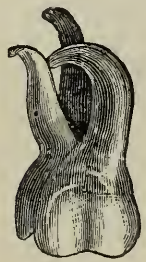


FIG. 7.

Distorted roots sometimes occasion serious fracture, and it will be observed in fig. 7, that the antero-buccal fang is curved until it has pierced the septum of the alveolus and rests upon the post buccal root. The inclination of the latter is to form a similar curve in the same direction; while, between the buccal fangs, there is no exit or place of escape for the process locked in that position. This is a difficult tooth to remove without fracture in the process, owing to constriction at the neck, and the peculiar formation of the roots.

Aggravated cases for extraction may be seen in figs. 3, 4, 8, 9, in which there is both distortion and exostosis. The bicuspid, fig. 8, will require to be turned out rather than drawn; while the removal of such a tooth as fig. 3, in which bulb-like exostosis is developed, may be looked upon as a case for the excising and root forceps. The constriction at the neck is still more marked than in fig. 7; and, were there no malformation of the roots, their divergence would still offer resistance to any attempt at dislodgment. In fig. 8, exostosis is complicated with the lingual fang

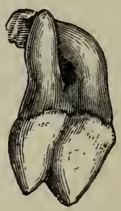


FIG. 8.

of the biscuspid lapping upon the curved buccal fang. Here again we might readily predict fracture to the buccal fang, although every care be taken to prevent it. Fig. 9 represents diffuse exostosis, occasioned, no doubt, by erosion at the neck; hyperplasia having been induced through pulp and periosteal irritation; the anomalous feature being that while one part of the tooth was receiving a deposit of extraordinary solidity, another was gradually being dissolved and lost. Erosion, like caries in the other examples figured, acts as an irritant to the pulp and periosteum.

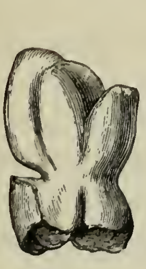


FIG. 9.

In figs. 10 and 11—carious teeth—such large deposits have accumulated upon the roots that the apices are lost in the attached process and cystic formations.

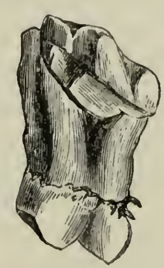


FIG. 10.

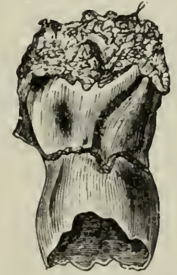


FIG. 11.

Figs. 12 and 13 illustrate some of the curious freaks of nature in uniting teeth. In the former, both teeth are exostosed, the crown of the posterior tooth being almost at right angles to its normal position; while in the latter, the bicuspid (*a*) has made its appearance as a supernumerary tooth, being firmly attached to its associate. On several of the teeth described, and which I pass for inspection, will be seen pearl-like prominences, showing the remarkable vigour of the pericementum in formations of this kind.

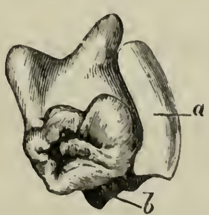


FIG. 12.

a. Root of posterior tooth.
b. Crown of posterior tooth.

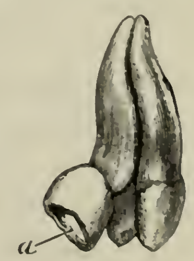


FIG. 13.

a. Crown of supernumerary tooth.

Anchylosis or gemination of teeth.

Diseased teeth, when neglected, produce irritation in the surrounding tissues to such an extent that, contrary to popular belief, the removal of the tooth does not always give immediate relief. The alveolus, the gums, and even the maxilla may partake of the inflammation, and may require judicious after-treatment. Fomentations, poultices with a little tincture of opium sprinkled upon them, or an anodyne cataplasm of poppy leaves can be used to alleviate pain. Applications of this kind, however, are not admissible where there is any threatening tendency to an external fistula, and when thus applied, may lead to most disfiguring consequences.

Hæmorrhage from extraction is not, as a rule, considered dangerous, yet deaths have occurred from inability to suppress the flow of blood. You will occasionally meet with patients of the hæmorrhagic diathesis, in whom the blood is deficient in fibrine and coagulative power. Hæmorrhage in such persons seems almost uncontrollable; the blood exuding either in a steady flow, or welling forth with the pulsating intervals of ruptured arterial circulation. The course ordinarily pursued in such cases consists in packing the socket of the tooth with lint, saturated with styptics, small pieces being introduced and forced into the extreme apex or floor of the socket, so as to compress the arterial trunk, and arrest hæmorrhage at its point of origin.

The apices of the roots of the first and second superior molars are adjusted to conical capsules formed in the floor of the antrum of Highmore; but occasionally this septum of bone is perforated by the roots of teeth projecting into that cavity, they being covered only by the lining membrane of the sinus; and, should they become diseased, that lining may be the seat of inflammation, and of the profuse formation of pus. The same effect is produced by severe catarrh. The general symptoms are a dull heavy pain in the affected region, with distention of the antrum, the parietes of which crepitate to the touch.

If either the superior first or second molar on the diseased side is decayed, it should be removed, with a view of penetrating the antrum through its socket. The second molar, however, is the tooth usually selected for extraction, owing to the fact that the socket of its palatine fang affords a channel leading most directly through the floor of the antrum; but should these teeth be sound, we have the alternative of making an opening into the antrum through the canine fossa. Entrance being effected, treatment should consist in evacuating, if possible, all septic matter, followed by copious syringing with warm water, and the use of a solution of permanganate of potash—or Condy's fluid; the opening to be kept patulous with a tent, and the treatment continued until the formation of pus has ceased. The antrum is occasionally attacked by more acute disorders,—generally complicated with peridental derangement—,and sometimes by malignant disease.

Although it is understood that the teeth are the Dentist's first object of attention, their not unfrequent connection with disease in the surrounding tissues makes it essentially important that the Dental practitioner should understand the distinguishing differences between tumours of a malignant and those of a benign character.

Carcinoma, in its earlier stages, often assimilates a non-malignant appearance, and it is only when microscopically examined, or when more decided symptoms, such as increase of size, attended with lancinating pains, are present, that its malignancy is discovered. It is advisable, where there seems to be an arrest of growth, to refrain from active measures, but to seek for and, if possible, remove the cause; remembering that even a malignant tumour may remain in a quiescent state for an indefinite period, unless developed through some extraneous influence. However, all tumours are to be carefully watched, and removed where there is any tendency to spread.

No source of irritation should be permitted to remain in the mouth, such as the fractured edges of the teeth, or roots projecting from the gums. In obscure cases where pain is experienced in the superior maxilla, the nose ought to be examined in connection with the teeth, for evidences of antral disturbance; for while polypus sometimes extends from the nose into the antrum, fungus may be forced from the antrum into the nose.

Should a muco-purulent discharge follow the instrument when exploring the antrum, the lesion is usually comparatively easy to treat; but when severe hæmorrhage ensues, the tumour may be strongly suspected as malignant.

The saliva in combination with the exudations of the mouth, forms calcareous deposits on the teeth, known as salivary calculus, or tartar (odontolithos). These formations vary in hardness and composition Some are deposited slowly in minute quantities, and do not appear to have any perceptible effect on the health; but others, from the nature of their constituents, are fetid combinations of animal and mineral matters. That the saliva is capable of depositing calculi is evinced at almost the commencement of its flow, by the formation of concrete matter within the ducts of the salivary glands. Ranula, or cystic tumours arising from obstruction of those passages, will occasionally require your attention; the glands, especially the sublingual, sometimes giving serious annoyance.

The word ranula is derived from *rana*, a frog; but this would give an incomplete idea of the complications of the disease to which it is applied, as ranula varies in its character. Sometimes there is only a slight enlargement of the glands, arising from superabundant secretion ; but, occasionally, massive tumours cause displacement of the tongue from its normal position. Where the cyst is thin, the tumour resembles a frog's belly—hence ranula—,and a cure is sometimes effected through rupture of the walls of the cyst. Temporary obstruction to the fluid of the glands through constriction of the sublingual ducts may occasion but little inconvenience ; but, should this stricture become continuous, accompanied by ptyalism, its influence will, after a time, be felt upon the general system. The contents of the cyst, in course of time, partly solidify, and may form salivary calculus ; but, more usually, the secretion becomes inspissated by the absorption of the more fluid constituents.

Ranula is considered to be most commonly an accumulation of fluid within the mucous follicles, or in the midst of the tissues beneath the tongue—even in the substance of the walls of the salivary ducts. In frog belly ranula, the wall of the cyst is semi-transparent, and the contents copious ; but, in other cases, the walls may constitute the larger bulk of the tumour, the cavity being small. Ranula is simulated by inflammatory swellings in the glands themselves ; but whether it be sebaceous deposits, pus, or saliva, which cause encysted tumours with enthickened vascular walls, the treatment is the same—incision followed by drainage, or the establishing of setons, and the injection of stimulating remedies.

Tartar is essentially an evidence of neglect, as the persistent use of the brush will in most cases prevent this disagreeable deposit; but there are cases in which it is not so easily controlled. The deposit soon hardens and insinuates itself between the gingival border and the cervical portion of the teeth, commencing usually upon the buccal surface of the molars and the lingual aspect of the incisors, owing to their proximity to the ducts of the parotid and sub-lingual glands, until retrocession of the gum is induced. Attempts to clean the teeth now cause so much irritation that they are frequently neglected, and the disease permitted to go on uninterruptedly, to the prejudice of both teeth and gums. This condition appears, in some instances, to be tolerated with little or no inconvenience, until the tartar nearly reaches the apices of the teeth, increasing until several teeth are cemented together by the deposit, which becomes so large that its contour can be traced externally upon the cheek (see fig. 14). But

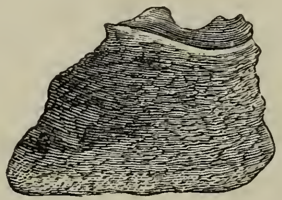


FIG. 14.

sometimes it is accompanied with much discomfort, anorexia, and general derangement of the system, while absorption of the alveolus and loss of the teeth are among the disastrous sequelæ, a case in point being given in fig. 15.

The two specimens which are here illustrated show to what extent salivary calculus may be tolerated in the mouth, fig. 14 representing the exact dimensions of a mass taken from molar teeth.

In fig. 15 the attachment of tartar to the lingual surface of a lower incisor, increased in bulk until, by its erosive influence upon the gum and alveolus, the tooth was lost. From these considerations it will be seen that the treatment of teeth with tartar upon them is important, and the operation of scaling a necessary prophylactic measure.

The instruments used in the removal of tartar are too well known to require description here, further than that their forms should be adapted to the varying aspects of the teeth, and, while using them, every precaution taken to avoid injury to the enamel; the junction of the surfaces being the line of cleavage. In cases of alveolar absorption and retrocession of the gum, carbolic acid may be applied by means of a stick of orange wood, flattened at the end, so as to permit the ready introduction of the medicine between the teeth and gums. Aromatic sulphuric acid is also sometimes used with most beneficial results, where the gums are hypertrophied.

The more advanced cases of tartar deposit cause atropy of the gums and alveolar process, which makes treatment a question of doubt and uncertainty.

A condition known as pyorrhœa alveolaris, or sometimes called "Rigg's disease," is characterised by a discharge of pus from the dental periosteum, the separation of that tissue from the cementum, and by the deposit of small, hard, dark coloured granules upon the root of the tooth. This disease is, in most cases, associated with constitutional debility; but the relation of the local to the general disease, as cause and effect, is apparently irregular.

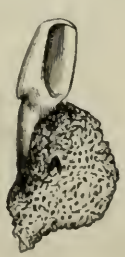


FIG. 15.

After your efforts to arrest disease, it would be well to instruct your patients how to take care of the organs upon which so much attention has been bestowed; warning them that fierce attacks spasmodically made with brushes constitute only an approach to that virtue. The teeth, though capable of resisting great force when in the exercise of their proper function, require gentle but thorough cleansing; and the practice of rubbing them with brushes that are too harsh is almost as reprehensible as the more indifferent zeal sometimes displayed of only brushing them occasionally.

An increasing interest in this matter is gradually pervading all classes of society, whereas the importance of considerate attention to this portion of the physical organism was formerly only recognised by those in the higher walks of life. Even there it was not the invariable rule, but the exception; and the stimulant then was more for the sake of personal appearance than from expectation of realising any actual practical benefit.

Let your aim be to improve this growing interest by impressing upon parents the necessity for periodical examinations of their children's mouths, calling attention to the many vicissitudes to which the teeth are subject during the period of first dentition, and especially combating the idea that, because these teeth are "temporary," attention to them is not necessary.

Hasty operations—the result frequently of opinions expressed by irresponsible parties—are productive of great mischief, the normal position and symmetrical articulation of the permanent teeth being, in many respects, dependent upon the presence or absence of the deciduous teeth.

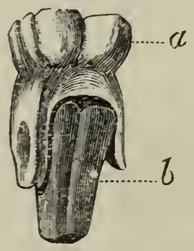


Fig. 16.

a. Deciduous molar with roots partly absorbed.

b. Permanent bicuspid, in course of development, brought away with the temporary molar.

A case in point is illustrated in fig. 16, which shows that extraction in early dentition should be deferred until the roots of the deciduous teeth are sufficiently absorbed to permit their removal without injury to the permanent ones. The accident pictured having actually occurred, I refer to it that you may be on your guard, although cases of this nature are extremely rare.

The physiological importance of the various subjects incorporated in these lectures must not be judged by their poverty of description, or I have been compelled to review in a too brief manner questions that have a literature of their own, and which demand a much more explicit consideration.

That I have repeated things with which you were already acquainted has been unavoidable, and that you will hear them again is to be expected; but each repetition will the more firmly impress, and give that facility of mental reference to facts which is the object of your studentship.

On the commencement of professional life, every young practitioner is apt to indulge the hope of an immediate request for his services; but this expectation is not always realised. The introduction may be considered the probationary test period; self-reliance and conscientious thoroughness being the essentials to success. I repeat the words "self-reliance," because it is not unlikely that you will have to contest any position you may wish to occupy with others as anxious as yourself to secure a practice.

In mouths systematically cared for, the services of the Dentist are materially abridged; but, on the other hand, neglect often involves an expenditure of time, for which no real compensation can be expected. You will not unfrequently be placed in an embarassing position, from the inability of your patients to appreciate the differences in expense existing in Dental operations.

This question has been the quicksand on which too many good resolutions have been stranded, seriously compromising the beauty, finish, and permanency of much work, and obstructing the advancement of thousands beyond a mediocre professional position. Unless restrictions of this nature are removed, operations of an elaborate character must be superseded by those involving less skill and expense. I would advocate a generous reception and investigation of new methods. Those who are inclined to censure should consider well any new principles advanced, for many intermediate operations are often required to demonstrate a single fact; and, to distinguish the inconsequent from the useful, new methods must conform to the physiological laws that dominate the human frame.

CELLULOID AND ITS MANIPULATION.

BY GILBERT WALKER, L.D.S.Eng.

THAT celluloid possesses very many of the attributes of a desirable base for artificial teeth, few who have seen it at all will doubt, and of those who have seen it in the mouth, I will venture to say, *not one.* As with all new substances that are little understood, nothing can be expected in the beginning, or indeed for the first few years, but a disheartening series of failures and disappointments, and in this celluloid has certainly been no exception; but its exceedingly natural colour, and—if properly and artistically arranged—its singular resemblance to the gums, have induced many gentlemen to exercise steady patience, ingenuity, and perseverance to overcome the peculiar difficulties of its manipulation, and to eradicate, or at least reduce to a minimum, its defects.

Starting from the results thus gained by the labours—and particularly the *failures*—of these experimentalists as my base, and adding about three years' personal experience, both in the working and the wearing, brings me to the unhesitating conclusion that celluloid *must* take its place—-and a very important one too—amongst the materials for artificial dentures. Already I feel its principal drawbacks *are* overcome by the use of more efficient apparatus, and in this belief I venture to record my experiments and their results, in the double hope that they may be of interest to some, as they certainly have been to me, and that any discoveries I may have made may be as a fresh platform for further progress by others interested in the question.

I am not one of those who suppose celluloid can ever supplant all other materials, but I do think it will be to vulcanite what vulcanite was to bone. I remember all the struggles that vulcanite had to find its way into any favour whatever, how, after having been patented in England as a "base for artificial teeth," it all but suffered a premature death: lay as it were in a trance for some ten or twelve years, then began to show signs of vigour under the more salubrious clime of American enterprise. How an American gentleman *reintroduced* it into England as an American invention, and how the only reception it met with for a considerable time was aptly expressed by an eminent practitioner, when he remarked, "I'm not going to mount teeth in mahogany." I may explain to the younger members of the profession that at that time its colour was actually a much darker brown than mahogany whilst we were all accustomed to the delicate, cleanly appearance of bone work. But the undoubted advantages it possessed of adaptibility, non-absorption, durability, economy, &c., over bone, enabled even the "mahogany" to force its way into use. And now, where is bone? But, oh, the sorry difficulties that beset the early workers! Who amongst them does not remember finding bands, and even teeth, imbedded in the middle of palates, or teeth apparently dissolved, and "mahogany" in their places? or on opening flasks, finding not plates, but distorted mahogany cinders to meet their distracted gaze? Yet experience and ingenuity overcame all these difficulties, vulcanisers were improved, and Mr. Childs discovered that one boiler with a little water to become superheated steam, was better, and far more certain in its work than the then cumbrous double boiler vulcaniser; after which came change on change, till we have the present handy and fairly perfect machine. Mahogany coloured rubber became brick red, this gave place (again through the exertions and knowledge of Mr. Childs) to "orange rubber," since which we have had many varieties of pink, and almost every colour under the sun, except *gum colour*. For this desirable end celluloid comes to give us relief, but brings with it—what we could very well have dispensed with—the labour, difficulty, and doubt of finding practical manipulation and apparatus.

As I am not attempting to give a history of celluloid, I will simply pass over the early failures of the oil-bath, glycérine-bath, &c., and commence with Mr. Winderling's most ingenious injecting apparatus. Here I may mention that all my experiments tend to the one conclusion that his theory of *injection* is the *correct one*. One of his own quaint but terse remarks to me speaks volumes. Respecting the ordinary celluloid blanks supplied by the depôts, he said, "they *have a form* moulded under great heat and pressure, which by great skill and care you *warp into the shape you require*," leaving it of course ever ready to resume its original form, or, as we call it, *warp out of fit*. In this I firmly believe; but, unfortunately for his system, he lost sight of the facts that moisture destroys the material when heated, and that the camphor can only be driven out of celluloid by a high temperature. However, let celluloid be worked as it may, none can read his little pamphlet without receiving many useful hints and "dodges" for overcoming the minor difficulties of manipulation; for instance, his method of boiling out the wax from a flask and injecting the celluloid without ever opening it, renders it possible to form plates with deep undercuts, to keep teeth, bands, gold plates, &c., *in situ* with an ease and certainty that can be obtained in no other manner, whilst any rising of the articulation is simply impossible, and I feel myself greatly indebted to him for the success I have obtained.

Dr. E. M. FLAGG (New York), in an article republished in the *British Journal of Dental Science*, of February 1st, 1881, grasps the whole of the difficulties of celluloid more thoroughly—according to my experience—than anything I have read elsewhere, but fails, I think, to suggest how to overcome some of the most important of them. I do not for a moment wish to pretend that I have brought celluloid to perfection; but I have succeeded, with the aid of an apparatus introduced by the Dental Manufacturing Company (who have most politely helped me by making alterations and additions to overcome the difficulties that arose, and to whom I tender my most grateful thanks), in obtaining celluloid plates little, if anything, short of the hardness of a nice tough springy vulcanite plate, that have *not warped* either wet or dry, and have not changed colour. I have many of these in wear amongst my patients—for a short time only, it is true, *i.e.*, about five months—,but there have been no complaints, and no cases to remake or repair. With Winderling's process I had this to do within a fortnight, in consequence of the teeth being bitten out of the unhardened celluloid. The colour, or rather the imperceptibility of the celluloid plates, is so pleasing to some patients, that they express themselves willing, if necessary, to have them renewed every six months rather than return to the use of vulcanite. For regulation plates I never found anything so suitable, and have used nothing else for years. Mr. Gartrell's injecting machine is also very ingenious and perfect in its working, but has the—to my mind—fatal mistake of having heated celluloid in contact with moisture, to the certain destruction of both texture and colour.

DR. CAMPBELL'S (America) NEW MODE HEATER—the last apparatus I have tried—is also an ingenious piece of mechanism, and next to the Dental Company's is, I believe, the most useful and reliable of those extant. It is, however, arranged for blanks, or on—as I prefer to call it—the warping principle, which my present experience does not warrant my relying upon, although I can quite imagine that, from the great heat it admits of using, the blank might take a "new form." As with the Company's machine, it has a dry chamber encircled by a double steam boiler, but in the former the heat is controlled by their delicate steam-gauge-gas-regulator, which does not allow the slightest variation of heat, a matter of vital importance in dealing at a high temperature with such an exceedingly delicate substance as celluloid.

In nearly all these processes, metal models are recommended, which, in my opinion, is as fatal a mistake as *moist heat itself*, and I think when I have described some of the results of my experiments, the conviction of my readers will be carried with me.

(*To be continued*).

BI-LATERAL ALVEOLAR ABSCESS,

A case treated at National Dental Hospital,

BY F. ROSE, L.D.S.Eng.

ELEANOR EARLE, æt. 10, presented herself on December 8th, 1880, for advice at National Dental Hospital, on account of large swellings on each side of lower maxilla. She was a pale, clear-complexioned, anæmic child, of very delicate aspect, with all the appearances of strumous diathesis. At the time of her first coming under my notice, there were large swellings over the regions of the lower molar teeth on each side, accompanied by great heat, well-marked fluctuation on palpation, and thinning of integument immediately below margin of lower maxilla, with a slight serous exudation; but no actual perforation. There was a hectic flush on cheeks, eyes dull, pulse quick and intermittent, in fact all the signs of acute abscess.

On looking into mouth, I found carious the second temporary and first permanent molars on each side. The latter were firm, but slightly tender on percussion; temporary molars very loose, and on moving them pus oozed up; the latter teeth evidently being the offending members.

The history of the case before coming to hospital was the same as so many cases of the kind. She had consulted a medical practitioner when first troubled with toothache and slight swelling, who had prescribed medicine, and recommended external poulticing. No cure being effected in this way, the parents lost faith, and came to get advice at the hospital.

The surgeons of the morning having departed, I took the responsibility of treatment. I extracted temporary molars, lanced abscesses externally below and parallel with line of jaw, bathed the parts with warm water, syringed dilute carbolic, and dressed incisions with cotton steeped in carbolic oil; prescribed a purgative, and a mouth wash of Condy's fluid. Appointed patient to come on the 10th to have permanent molars filled, and abscesses dressed: in meantime patient to frequently bathe the wounds, and take Parish's Chemical Food. On extraction of teeth, a free vent was given for a considerable quantity of pus.

Dec. 10th.—Patient looking better, but still a little hectic, and tongue furred. Swellings subsided, but on removal of dressing a slight quantity of pus was evacuated. On this day Mr. Gaddes first saw patient, and changed medicine, recommending syrupus ferri iodidi. Redressed abscesses, after syringing with dilute carbolic. Excavated permanent molars; removed remnants of pulps, and dressed with creosote and tannin.

Dec. 11th.—Almost miraculous change in appearance of patient to be brought about in one day, hectic having disappeared, and patient looking much better; abscesses still discharging a little. Probed to see if connected with permanent molars, but could find no connection. Dressed teeth with creosote and tannin, and filled with gutta percha syringed carbolic. Patient did not keep next appointment, and did not come to hospital till January 14th: in meantime she had been neglected.

Jan. 14th, 1881.—Abscesses reformed, chiefly on right side. Left side only a little lump with pouting granulations. Cauterized both with strong carbolic, after syringing. Patient had been dressing with moist dressing. Recommended dry dressing. Sympathetic inflammation or absorption of septic matter had caused slight lymphatic swelling under chin. Again ordered Syrupus ferri iodidi.

Jan. 17th.—Much better. Swelling under chin nearly settled down. Touched granulations with strong carbolic. Syringed with eucalyptus. Cleared out G. P. fillings to see if teeth all right. Found dressings quite sweet. Renewed them, and sealed up again.

Saw patient about every three or four days till February 26th. Both abscesses subsided, but still persisting as little angry-looking discharging pustules. Could on no occasion get probe to trace abscesses to permanent teeth, which remained firm and apparently healthy, with no tenderness.

March 2nd.—On this day the abscess on left side has healed up and cicatrized. On right side, still a little discharge. Cauterized granulations and renewed creosote and tannin, though old dressing not offensive.

March 16th.—Saw patient several times in meanwhile, using same treatment. Now she was in more or less the same condition; but left abscess again formed a small yellow spot containing pus. Evacuated pus, cauterized granulations, and injected dilute iodine by Mr. Gaddes' recommendation.

March 17th.—Change for better very great; on left side nearly healed; on right side still obstinate. Renewed Syrupus ferri iodidi, after consultation with Mr. Gaddes. Again injected iodine, and cauterized granulations.

March 21st.—Left side almost healed; right side obstinate. Same treatment. Changed prescription to one with a little cod liver oil in it.

℞ Potassii iodidi, gr. xi
Syrupi ferri iodidi, ʒ iv.
Olei Morrhuæ, ad ℥ iv.
Misce. To take a tablespoonful twice a day.

March 26th.—Left side quite healed, with healthy contracted cicatrix; right side still discharging. Carbolic syringing to discharging abscess.

April 1st.—Left side still healed and cicatrix fast disappearing, promising no great disfigurement. Right side still discharging, but looking much healthier.

April 5th.—The wound on left side being quite healthy, and on removal of dressing from tooth all being found sweet, filled tooth with amalgam down to apex of root. Syringed one on right side with iodine. Mr. Gaddes gave calcium sulphide pills.

April 9th.—Both sides again discharging. The child was out of sorts and slightly hectic. Mr. Gaddes and others consulted. Removed teeth under gas. Pus was found round the roots, and the periosteum denuded in many places.

May 20th.—Visit. Sinuses and wounds healed. Child quite well.

REMARKS.—This case was one with many points of interest. By diligent treatment, extending over three months, the sinus on the left side quite healed, and the abscess was, to all appearance, thoroughly obliterated. To the same treatment the abscess on the other side did not yield, and here continued a slight discharge from the sinus. Sulphide of calcium, as a preparation reputed to disperse inflammation and mature abscess, was administered. Within two days after taking this medicine, not only was there a profuse discharge of pus from the right sinus, but suppuration was re-established on the left side, after the parts had beautifully healed, and so remained for over a fortnight. The child's appearance, too, was now languid and hectic. These results point very strongly to the sulphide of calcicum for their manifestation.

BOOK REVIEW.

DEFORMITIES OF THE MOUTH, CONGENITAL AND ACQUIRED, WITH THEIR MECHANICAL TREATMENT. By OAKLEY COLES. Third Edition. London : J. & A. Churchill.

A natural outcome of the increase of knowledge is classification, and as the several classes grow by the multiplicity of their forms, symbols, functions and relations, does each class, or group of classes, of itself require special study. From the inability of the human mind to comprehend and treat successfully all that is knowable do specialties arise. Medicine, as one of the specialties of science, has now several sub-sections or specialties, and Dental Surgery is one of them. In Dental literature, already published, there are numerous branches represented by, and treated of, in text-books—as Dental Anatomy, Dental Surgery, Dental Therapeutics, Dental Mechanics, &c. Dental Surgery, dealing as it does in a general way with diseases of the teeth and contiguous parts, has its special features of Operative Dental Surgery, as applied to filling cavities in teeth, and of Oral Deformities. This further sub-division of Dental Surgery, and the works upon the latter section, forcibly indicate that Dentistry is advancing in the field of knowledge.

In the third edition of "Deformities of the Mouth," now before us, Mr. Coles describes the manner in which he obtained delineations of the external contour of the head and hard palate. For the purpose of geometrical outline and greater mathematical precision, instead of strips of lead moulded to the bones, Prof. Broca's instrument is exceedingly more accurate and reliable; indeed, the tracings obtained by it are absolutely correct.

The foot note on page 5 refers the reader to Herbert Spencer's "Principles of Biology," but there is no relevancy of the subjects.

The history of the discovery of the pre-maxillæ in man is one of interest, and serves to show the fallibility of human speculation, and the gross injustice done to science in putting forth mere opinion and theory as facts.

Meckel's cartilage, as one of the embryonic cephalic arches, representing the lower jaw and malleus, takes no part in the ossification of the mandible; but fibrous tissue is developed around and chiefly in front of the cartilage, and this is entirely the seat of bone development, and not partly in the Meckelian cartilage, as stated on page 19. With regard to the period at which ossification commences in the upper maxilla, we find it variously stated, as the 7th week, according to Beaunis and Bouchard, and, according to Callender, at about the 9th week of embryonic life.

Of the manner in which any aberration of growth or development may lead to the formation of hare-lip and cleft palate, Mr. Coles says, if the embryonic buds representing the "superior maxillary processes do not both unite with the superficial portion of the fronto-nasal process, we have bilateral hare-lip, while if one only unites, unilateral hare-lip will be produced. As with the soft parts so with the bones. If the superior maxillary bones do not coalesce with the inter-maxillary bones, the result is single or double alveolar fissure, according to whether the arrested union is unilateral or bilateral. If the superior maxillary bones themselves do not unite in the median line, palatine fissure or true cleft palate will result. Again, the vomer and sphenoid bones may grow too rapidly in comparison with adjacent parts, preventing the union of the halves of the palate, and pushing the intermaxillary bones so far in advance of the lateral processes of the superior maxillary bones as to render them incapable of forming the key to the alveolar arch. This form of the defect illustrates the irregularity of development to which allusion has already been made. Finally, the intermaxillary bones may not be developed at all. . . . in such case producing fissure in the lip and alveolus in the median line.

"It will be obvious from the foregoing considerations that the period at which arrest of development takes place must determine the character of the deformity. . . . That no cause which does not come into activity until after the tenth week of intra-uterine life can have the slightest influence on the integrity of the palate."

Regarding the causes of cleft palate Mr. Coles is of opinion that the ultimate antecedent, not only of cleft palate, but also of faulty development of the brain, with which palatal defect is frequently associated, is *indirect* hereditary influence; and that "no sufficient statistics have as yet been brought forward to show that the actual presence of the deformity in the parent has any *direct* predisposing influence on its occurrence in the child. . . . I feel, however, that it may be confidently stated that the deformity cannot be produced from any impression received by the mother during pregnancy."

Where there exists hare-lip with cleft palate, and the hare-lip has been operated upon during infancy, the period best suited for such, "by the time the child has arrived at the age of ten or twelve years, the dental arch, instead of having the breadth of the normal jaw (as compared with the size of the rest of the head), is found to be exceedingly contracted, the two margins of the fissure in the alveolar ridge being very near to each other, if not in actual contact. The change is produced, in my opinion, by the contraction of the lip after the operation has been performed upon it." This action of the lips upon the dental arch corresponds with what is found in chronic enlargement of the tonsils. In cases of this nature, occurring in early life, the slight difficulty in breathing leads to the mouth being habitually kept open, and by the consequent slight but unremittent pressure of the lips upon the jaws are V-shaped maxillæ produced.

In Chapter V. our author deals with the classification of deformities of the upper jaw. Discarding the old and certainly indefinite terminology, as contracted arch, saddle-shaped palate, highly arched palate, &c., Mr. Coles has adopted a new nomenclature, based upon geometrical principles. A triangle is formed with a base line extending from the centre of the distal surface of the second molar on each side, near the level of the alveolus; the other lines extending from the point of contact of the mesial surfaces of the two central incisor teeth to the extremities of the base line. "We have thus produced a triangle, giving at the molars the breadth of the jaw, and by a line drawn from the apex of the triangle to the centre of the base line the length of the jaw, exclusive, of course, of the space occupied by the third molars." "At a distance from the base corresponding with the distance of the second bicuspids from the distal surface of the second molar," a line is allowed to traverse the triangle. This gives the interbicuspid width or measurement. Having in this way obtained from a typical jaw a standard figure, by allowing for certain contingencies, can the several varieties of deformity of the upper jaw be classified. According to the variation of the measurements of a jaw from the type or standard does Mr. Coles designate it long, short, large, small, prominent pre-maxillary region, deficient pre-maxillary region, and true V-shaped arch. This geometrical method of measuring jaws, and the adoption of nomenclature expressing deviation from an acknowledged standard, give at once a descriptive language, more accurate and comprehensible than has hitherto existed.

(*To be concluded.*)

SYPHILITIC AND CANCEROUS ULCERATION OF THE TONGUE.

A Clinical Lecture delivered in University College Hospital, on May, 16th, 1881.

BY CHRISTOPHER HEATH, F.R.C.S.,
Holme Prof. of Clinical Surgery.

Ulceration of the tongue may be simple, syphilitic, or cancerous. The *simple ulcer* is often caused by the irritation of a sharp tooth, or may be due to dyspepsia. It is small and superficial, and, unless due to local irritation, is generally multiple, and often found beneath the tongue. It is painful, and interferes with the movements of the tongue, but yields readily to treatment. The removal of the sharp corner of a decayed tooth with a file, and the subsequent application of a stick of nitrate of silver to the ulcer, are generally sufficient to effect a cure when the cause is local. When it is constitutional, a brisk purge, with the local use of the glycerine of tannin, or any astringent gargle, will be sufficient treatment.

Syphilitic ulceration may appear during the secondary stage of the disorder along the edges of the tongue, and will almost always be found to have a corresponding white patch on the mucous membrane of the cheek. These ulcers have no induration at their bases, but, when healed, leave an irregular fissured border, which is very characteristic. A later form of ulceration is found in fissures of the dorsum, which leave irregular furrows in healing.

The deep syphilitic ulcer is due to the breaking down of a gumma, and it is this kind which is apt to be confounded with cancerous ulcerations. The ulcer is irregular, with everted edges, and presents a yellowish slough at its base, in which a varying amount of induration can be detected. It is often in the central portion of the tongue, whereas epithelioma is more commonly at the sides; and careful investigation will show that a lump has been noticed in the organ before the ulceration commenced, and that the induration diminishes as the ulcer grows; whereas in cancer the induration follows the ulcer, and steadily increases in extent. Still, it must be admitted that cases occur in which it is impossible to give an accurate diagnosis without having recourse to the tentative administration of iodide of potassium, and that, even then, it is not always possible to be sure that epithelioma has not begun in an old tertiary sore.

In the treatment of syphilitic ulceration of the tongue, regard must be had to the stage of syphilis in which it occurs, and the previous treatment undergone. In the superficial ulceration, mercury in the form of bichloride or iodide is much more effectual than the iodides alone, and should be had recourse to, unless the patient's health has been shaken by previous courses of the drug. In the tertiary form of ulcerated gumma, iodide of potassium will certainly effect a rapid cure if the ulceration be recent, provided it be given in sufficient doses, beginning with not less than ten grains thrice daily, and being increased to thirty-grain doses if smaller ones be not effectual. In all forms of syphilitic ulceration, the local application of mercury is useful; but it must be applied, not in the form of gargles, which are used and spat out at once, but as a lotion, to be held in the mouth for five minutes, so as to "pickle" the tongue. A lotion containing a quarter of a grain of bichloride of mercury to an ounce of water, with a little glycerine or honey, is a very good form, and the strength may be increased after a time with advantage. Care must, of course be taken, that none of the fluid is swallowed.

Cancerous ulceration is of the epitheliomatous type, unless it should supervene in the latter stage of scirrhus, which is of rare occurrence in the tongue. Attacking the side of the tongue, in patients over forty years of age, the onset of the disease is so insidious as to attract little attention, the ulcer being often attributed (and perhaps correctly as to origin) to the irritation of a tooth. When well developed, the ulcer is usually oval in shape, with sharply cut edges, and a marked induration beneath it when the parts are grasped by the finger and thumb. The pain of cancerous ulceration is a well-marked and early symptom, being lancinating and acute, and shooting up into the ear. The irritation causes a great flow of saliva, and the tongue is moved with difficulty, at first because of the pain produced, and later on because it is bound down by the infiltration of all the structures. The submaxillary lymphatic glands become involved early in the disease, being at first swollen and tender, and later on being apt to suppurate and break down, causing large openings beneath the jaw.

Should the disease spread towards the base of the tongue, death is occasionally due to hæmorrhage from one of the lingual arteries; but in cases where the anterior part of the tongue is involved, it not unfrequently becomes adherent to the incisor portion of the lower jaw, and ultimately infiltrates that bone. In these cases, the patient has generally a longer life of great misery, and dies at length, exhausted by pain and discharges from numerous open sores about the chin and angles of the jaw.

In the treatment of epithelioma of the tongue, all surgeons of experience are agreed as to the inutility of medication, whether topical or general, and the advisability of early and complete removal of the disease. A recent discussion at the Société de Chirurgie of Paris (*Medical Times and Gazette*, January 8th, 1881), has shown that all the leading surgeons of that city are agreed with those of other countries, that the administration of iodide of potassium in true epithelioma is useless, and that the constant application of nitrate of silver is harmful. The difficulty in practice is to induce a patient to take a sufficiently grave view of his case at an early stage, when an operation may be undertaken with advantage, and with a fair prospect of relief, prolonged if not permanent. In the later stages, when the lymphatic glands are involved, it becomes a question whether any interference is advisable, and many surgeons would refuse an operation ; but it appears to me that, in many even of the worst cases, temporary relief may often be given by operating, provided the patient is prepared to run the immediate risk of the proceeding, which is undoubtedly great. Still, life prolonged in misery is worse than death following close upon the operation, and I have been thanked more than once by dying patients for having given relief during the few days for which they survived the operation. Anæsthetics have robbed operations of so much of their horror, that patients may now-a-days be induced to submit to extensive mutilations, which would have been impossible, or at least unadvisable, without chloroform. Chloroform is necessarily the anæsthetic to be employed in operations upon the tongue, for ether is inadmissible ; first, because of the difficulty of keeping the patient under its influence when atmospheric air necessarily gains free admission ; and secondly, because if, as often happens, a cautery is required in the course of the operation, a dangerous explosion and conflagration in the patient's mouth may be caused by the inflammable vapour of the ether.

Ligature of the lingual artery has been advocated in order to check the growth of cancer of the tongue, as well as for the arrest of hæmorrhage, but has not yielded the results anticipated.

Division of the lingual nerve is another palliative operation recommended by Hilton and Moore ; and this certainly is efficacious, for a time at least, in relieving the pain of a cancer involving the side and tip of the tongue. The operation is not a difficult one, and has the negative advantage of doing no harm, if it effects little good.

Removal of portions of the tongue with the knife is an operation which has fallen into disuse, owing to the hæmorrhage ordinarily accompanying it. In such cases, and in cases of secondary hæmorrhage after removal of large portions of the tongue, I have found that it is practicable to arrest all hæmorrhage in the following way. The forefinger, passed well down to the epiglottis, is made to hook forward the hyoid bone, and drag it up as far as practicable towards the symphysis menti. The effect of this is to stretch the lingual arteries so as to completely control for the time the flow of blood through them ; and in this way portions of the anterior part of the tongue may be cut off almost bloodlessly.

The gälvanic écraseur, used for removal of portions or the whole of the tongue, has the advantage of cutting readily through the tissues, which it sears at the same time, thus preventing all hæmorrhage at the moment. It has, however, the drawback, that the separation of the slough necessarily formed by the cautery is very apt to lead to secondary hæmorrhage some days after the operation, and hence its use has been abandoned by many surgeons who formerly employed the galvanic écraseur.

Nunneley's method of applying the écraseur for removal of the entire tongue is as follows. An incision is made in the median line between the chin and the hyoid bone, and is carried up between the genio-hyoglossi muscles into the mouth ; and the chain of an écraseur is carried through this. The base of the tongue being thus transfixed from above downwards by three pins, the chain is passed behind them, and the écraseur is worked from beneath the chin. The objection to this method is, that the tongue is necessarily cut obliquely, notwithstanding the use of the pins. Its advantage is, that a useful drain for discharges is maintained from the floor of the mouth.

Sédillot and Syme were the first to divide the lower jaw in order more thoroughly to extirpate the tongue. The operation is a very severe one, but affords the only satisfactory method of dealing with cases of extensive disease of the tongue, in which the floor of the mouth is involved.

In all operations for removal of the tongue, it is well to be prepared for unexpected hæmorrhage, which may be very urgent. Blood collecting in the pharynx may embarrass the breathing very much, and, by the congestion produced, may keep up venous bleeding. Under these circumstances it is well to perform laryngotomy at once ; and if blood have entered the lungs, as is very apt to happen when the tongue is dragged forward, to suck out the blood through the tube. I have twice seen patients rescued from imminent danger of suffocation in this way, ultimately making good recoveries.

With regard to cleanliness and prevention of fœtor, it is very desirable that, at the time of the operation, all divided tissues should be thoroughly mopped with a forty-grain solution of chloride of zinc, which not only obviates fœtor, but tends powerfully to prevent the absorption of septic matter.

The frequent washing out of the mouth with a lotion of permanganate of potash or lime (the latter by preference) is most readily accomplished with a syphon-douche, fitted with a soft India-rubber nipple, which the patient can direct himself, without risk of hurting the mouth. After each washing the mouth should be brushed out with the glycerine of carbolic acid or "terebene," either of which answers admirably in preventing fœtor.

In cases of recurrence, after removal of the tongue for epithelioma, the disease shows itself in the stump, or the submaxillary lymphatic glands; or more frequently, I think, in both. The infiltration of the glands occasionally spreads to those beneath the sterno-mastoid, should the patient survive sufficiently long; but death usually supervenes, after a few months, from general asthenia and exhaustion, the sufferer being worn out with pain, and by the constant discharge, should the submaxillary lymphatic glands suppurate and discharge externally, as they frequently do. In cases where recovery is permanent, and the patient remains well for years, one is almost tempted to suspect a mistaken diagnosis; and it must be acknowledged that mistakes have been made by good surgeons in removing tongues, the subject of gumma, for examples of epithelioma. I am able, however, to record survival for over twelve years, in a patient from whom I removed what was believed to be a tongue affected by medullary cancer. The patient was sixty years of age, and the disease had existed six months. On looking into the mouth there was, between the tongue and the lower jaw, on the left side, a ragged ulcerated surface occupying the floor of the mouth. This was prolonged to the side of the tongue, and, with the finger, a large mass could be felt in the substance of the organ, extending beyond the median line and to about two inches from the tip. The patient complained of constant pain in the tongue, but was otherwise in good health. There was a slight enlargement of one of the submaxillary lymphatic glands. After section of the lower jaw in the median line I removed, with the écraseur, the anterior half of the tongue in September, 1868. The patient made a good but slow recovery, and called on me in 1880, nearly twelve years after the operation, perfectly well. The part removed was exhibited to the Pathological Society of London, and was submitted to the Committee on Morbid Growths. To the naked eye the tumour presented the appearance of medullary cancer, and was reported by the Committee to consist of cells and nuclei. The conclusion drawn was as follows:—"The opinion we formed is, that the tumour is essentially a cell-growth, invading and displacing the normal tissues, the cell-growth forming equally the more obvious cell-structure of the tumour and its fibrous portion. We may add, that it seemed to us most probable that the larger forms of cells were developed out of the smaller forms, and that therefore the spongy portion of the tumour, in which the larger cells were most abundant, represented a later phase of development than the homologous portion" (*Pathological Society's Transactions*, vol. xx.). In this case I noticed particularly a point which is not often seen, viz., the extent to which the portion of tongue left behind grows or becomes stretched. Notwithstanding the extensive removal, the man, some years afterwards, appeared to have a normally sized tongue, but rather more sessile in the mouth than usual.

When recurrence of cancer takes place the case is generally beyond surgical aid, the disease infiltrating the tissues of the mouth and of the neck to an extent which usually forbids any interference. It seems to me, however, that occasionally an attempt should be made to rescue the sufferer from an early and miserable death.—Abstract from *British Medical Journal.*

DEATHS FROM SWALLOWING ARTIFICIAL TEETH.

The *Lancet* records a case of death from swallowing artificial teeth which lately came before Mr. H. C. Yates, the coroner for Sandbach, and is rightly stigmatised by the local journals as "extraordinary," albeit that the facts are of a very ordinary kind. On the night of April 9th a Mrs. Froggatt, aged eighty-two, having been undressed by her servant in the presence of the servant's little daughter, bolted her bedroom door on the inside and retired to bed. The next morning she did not ring as usual, and when called failed to answer. The servant, in the presence of her daughter and another woman, then broke in a panel of the door, drew back the bolt, entered the room, and found Mrs. Froggatt dead. The medical man who was called in testified, in effect, that deceased had probably been convulsed at the moment of death, and searching for the cause he had found a set of twelve false teeth, which she had forgotten to remove when she went to bed, jammed into the lower part of the pharynx and obstructing the larynx. The medical opinion was that death had resulted from suffocation due to the impaction of the false teeth. Notwithstanding this a post-mortem examination was ordered, and a medical gentleman, other than the one who was called to the deceased, was requested to make it. The post-mortem afforded evidence of death from suffocation, and an analysis of the contents of the stomach showed that it did not contain any poison. Not a particle of the evidence given at the inquest was contradicted, and to all ordinary minds the cause of death must have seemed certain. The coroner's jury, however, "drest in a little brief authority," thought fit to return the following verdict after a deliberation of half an hour's duration:—"That the deceased died from suffocation, but that there has not been sufficient evidence brought before them to show how such suffocation was caused. The jury wish to add that they consider Dr. Davies was guilty of an error in judgment in having taken the teeth from the deceased's throat without proper authority!"

Another case is reported in the *Canadian Journal of Medical Science*, in which death from hæmatemesis ensued a week after the swallowing of the plate of teeth. It is stated that on January 20th of this year Mrs. B——, æt. 33, was supping some soup, when a plate with two false teeth attached became loosened and slipped down her throat.

Violent retching followed, lasting for several hours, but was finally allayed, either from the stomach becoming accustomed to the foreign body, or from bismuth which was freely administered. A dull, heavy pain was complained of over epigastrium and in the back over region of stomach, which remained until death. The retching at times recurred, but only slightly. A difficulty in swallowing was complained of, even liquids causing pain. The patient was ordered to remain in bed, and to take bread and milk, corn starch, or any fluid or mucilagious food. These instructions were not followed, but the patient persisted in keeping about and doing her usual "housework." Just one week after the accident happened the patient was seized with violent hæmatemesis, accompanied with purging. The cause of the hæmorrhage was considered to be due to the severing of one of the arteries of the stomach. Ergotine was used hypodermically in eight-grain doses every three hours. All efforts of treatment by the mouth only aggravated the symptoms. The vomiting soon ceased, but the purging continued until the end; and seventeen hours after the appearance of the first urgent symptoms the patient died.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The last meeting of the Session took place at 40, Leicester Square, on the 15th ult., Mr. Thos. Arnold Rogers, President, in the Chair.

On taking his seat the President alluded to the loss the Society had sustained since its last meeting through the death of Mr. Isaac Sheffield. In him the Society had lost one of its oldest members, a Past-President, and one who had always taken great interest in its progress. The Council had sent a message of condolence to his family.

He also announced that the proposal of the Council to hold a Conversazione on the evening of Aug. 2nd, the first day of the International Medical Congress, had been unanimously approved of by the Committee of the Dental Section.

Mr. Hilditch Harding showed an upper central incisor, which he had removed from the mouth of a boy on account of abscess about the root. Half of the crown had been broken off by a fall some time before. On examining the tooth, a fragment of wood was found projecting about a quarter of an inch from the apical foramen: this had, of course, caused the abscess. The boy said he had been in the habit of chewing wood occasionally for amusement, but he had no idea when or how this splinter had got into the tooth.

Mr. Coleman showed an upper wisdom tooth which he had extracted under the following circumstances. The patient came to him complaining of pain in the tooth, which was carious. After an unsuccessful attempt to save the tooth, Mr. Coleman extracted it. It came away with unexpected facility, and on looking at it, it appeared as if one of the fangs had been left behind. A hard substance could also be felt in the socket, but this on further examination proved to be a second wisdom tooth which was coming down above the first, and the pressure of which had caused absorption of the root of the extracted tooth. He also exhibited a model taken from a patient at St. Bartholomew's Hospital who had a hard growth on both sides of the lower jaw: it had been four years in forming. The lower teeth had been deflected inwards by it, so that the upper teeth bit on the external surface of the lower ones.

Mr. S. ATKINSON, of Naples, showed several models taken from patients who had been operated on for tumours of the jaws, together with the plates, &c., by means of which he had made good the loss of tissue resulting from the operations. Thus, in one case, almost the whole of the right half of the upper jaw had been removed, the deficiency being supplied by a vulcanite plate. In another the nose and part of the cheek had been removed, as well as half the palate. This had been supplied by means of a piece of semi-vulcanised rubber carefully moulded and painted, the result being that at a distance of a few feet the disfigurement was scarcely perceptible.

Mr. Atkinson showed also models of two cases in which half of the lower jaw had been removed. These, he said, were much more difficult cases to treat, on account of the slight support afforded by the remaining fragment of the bone, and the great tendency there was for this to be drawn backwards and inwards by muscular action.

Mr. CHENEY, of Manchester, showed several novelties of his own contrivance. One was a vulcanite denture, the palate of which he had covered with gold foil before vulcanising. Gold being a better conductor of heat than vulcanite, he hoped that this combination would make the plate cooler in the mouth.

Mr. DAVID HEPBURN then read a paper on "Chronic Suppuration connected with the Teeth."

He did not intend to refer to ordinary cases of chronic alveolar abscess, where a fistulous opening existed on the surface of the mucous membrane, communicating by a short canal with the root of a tooth, but to those more complicated cases in which there was a continuous or intermittent discharge which had penetrated to a part remote from the original situation of the mischief, involving in its course the destruction of a large amount of tissue. Thus, in a case which he had recently been treating, an impacted wisdom tooth had given rise to an abscess, the body of which was situated in the tissues behind the ramus of the lower jaw, but which extended also as far forwards as the canine, and downwards into the neck. When these cases became chronic the discharge might rather be serous than purulent, but in others it was purulent and very offensive, leading one to suspect the presence of dead bone. Even in the absence of dead bone, matter, when collected in a tortuous canal or cavity communicating with the mouth, was under conditions highly favourable to putrescence, and strong antiseptics were required to prevent this change : in cases where it was not possible entirely to check the discharge, we could render the patient a great service by disinfecting it. The most satisfactory agent for this purpose was the Eucalyptus oil, the use of which had been suggested by Mr. Arthur Underwood. After having used this remedy in some very aggravated cases, he felt that he could scarcely speak too highly in its praise.

In most cases the extraction of the teeth which had been the original cause of the irritation would be followed by the closure of the sinus, &c., but sometimes little improvement would result, and in such cases it might generally be concluded that some small portion of detached bone remained behind, and was keeping up the irritation. But this could not always be discovered, even by the most careful search with the probe, and it might remain for months, and even for years, surrounded by fibrinous deposits, without being absorbed. When at last, perhaps after protracted treatment, this was discovered and could be removed, a rapid cure resulted.

Mr. HEPBURN related several cases illustrating these points. In one of them the patient was under treatment for five months, and was eventually cured by the extraction of a right upper lateral. In another, the patient, a young man, had, before he applied to Mr. Hepburn, been suffering for seven months from a profuse discharge of offensive pus into the mouth, coming from the socket of an extracted right upper lateral. Active treatment was persisted in for eight months with but partial success, when suspicion fell upon the centrals, which were broken and unsightly. These were extracted, and at the bottom of the socket of the right central a piece of dead bone was found with a canal which communicated in a circuitous manner with the sinus which had been so long discharging. The patient had improved greatly since the extraction of these teeth, but the dead bone had not come away, and he was still under treatment. These were cases which were a great source of trouble and anxiety to the practitioner and of distress to the patient; and he (Mr. Hepburn) hoped that those present would give their experience with regard to them, especially in the matter of pathology and best modes of treatment, and that by the discussion some light would be thrown upon one of the difficulties of the profession.

Mr. ARTHUR UNDERWOOD said he was very pleased to hear that

Mr. Hepburn had formed so high an opinion of the value of Eucalyptus oil, though this only coincided with his own experience. It was certainly a very powerful antiseptic, more permanent in its effects than carbolic acid, and whilst possessing valuable stimulating properties it did not act as an escharotic, as carbolic acid did when used in a concentrated form. It would generally be found that the duration of the treatment of such cases could be greatly shortened by the use of this oil, but it was only thoroughly effectual when applied to a smooth surface; a piece of dead bone was a secure haven for bacteria, into the recesses of which the Eucalyptus oil could not penetrate. Mr. Hepburn had said that the antiseptic treatment of suppurating cavities connected with the mouth must necessarily be imperfect, but he (Mr. Underwood) believed that this was only the case when dead bone was present; under other circumstances, if sufficient pains were taken, the discharge could be kept perfectly sweet, and free from all traces of decomposition.

Mr. Hunt thought that too much was made of the presence of bacteria. It might be quite true that the Eucalyptus oil was fatal to bacteria, but he did not think that of itself would account for all its good effects. Even in health we all swarm with bacteria, and no one thinks anything about them. There was no doubt that in the majority of cases these chronic sinuses were dependent on the presence of dead bone, but they were also lined with secreting membrane in a bad state. The source of irritation should be removed, the diseased lining membrane scraped off, and the sinus would then heal without further trouble.

Mr. F. H. Weiss remarked that in simple chronic alveolar abscess the discharge was serous; it might be scanty or abundant, but it was not offensive. If the discharge was offensive the existence of dead bone might be strongly suspected.

Mr. Gaddes briefly related the case which is fully recorded on page 20.

Mr. Hepburn said in reply that he had found the effects of the Eucalyptus oil much more lasting than those of carbolic acid; lint saturated with the latter quickly became fœtid in the mouth, but that dressed with the Eucalyptus he found quite sweet, even after three days. The smell was also much more agreeable to the patient. In many of these cases the piece of dead bone which gave rise to all the trouble was very small, and consequently difficult to discover, and yet it might keep up irritation for many months. With regard to Mr. Hunt's remarks, he could only refer him to the experiments of Koch (published by New Syd. Society), and of Cheyne, one of Prof. Lister's assistants. They found that bacteria were invariably present in large numbers in putrescent pus. He quite agreed with Mr. Gaddes as to the value of tincture of iodine in the treatment of these chronic sinuses.

The President then proposed a vote of thanks to Mr. Hepburn and the other contributors of the evening, and this having been carried unanimously, the meeting terminated.

INTERNATIONAL MEDICAL CONGRESS.

The following is the official programme of the general arrangements of the Congress :—

Intending Members, from the country or abroad, are requested to communicate to the Hon. Secretary-General their desire to become Members of the Congress, and to pay their Membership Subscription of One Guinea. Residents in London will please to inscribe their names, as soon as convenient, in the Register now lying at the Royal College of Physicians for the purpose, where the Membership Subscription will also be received.

America, and most of the European Governments, have nominated Deputies to represent them.

Upwards of 1,300 probable members have already inscribed, 300 of whom are foreigners, but subscriptions are still required.

An Informal Reception will take place at the Royal College of Physicians, Pall Mall East, on Tuesday afternoon, Aug. 2nd, from 3 p.m. to 6 p.m., at which the Executive and Reception Committees will meet the Members of the Congress.

The Opening Meeting of the Congress will be held in St. James's Great Hall, on Wednesday, Aug. 3rd, at 11 a.m. Entrances in Regent Street and Piccadilly.

The other General Meetings will be held in the Theatre of the University of London. Entrance in Burlington Gardens. The Sections will meet in the places assigned to them.

The Offices of the Reception Committee are in the College of Physicians, Pall Mall East, at the North-west corner of Trafalgar Square.

The Reception Committee will meet daily during the week at 3 p.m. in the Censor's Room of the College of Physicians.

The Office of the Reception Committee at the College of Physicians will be open for the Registration of Members on and after Monday, July 18th. Members are requested to call as soon as possible, after their arrival in London, to enter their names and addresses in the Register, when they will be supplied with Programmes of Business and Tickets for Membership, Excursions and Entertainments. Every possible information will be given as to the prices and situation of convenient Hotels and Lodgings.

Members wishing to take part in any of the Excursions, or to visit any of the private and public places of interest open on the occasion, must enter their names in the proper book, at the College of Physicians, at the earliest opportunity, in order that the necessary arrangements may be made.

The Office of the Editors of the Daily Programme is on the first floor in the College of Physicians, where MSS. of all business to be transacted in the Sections on the next day, must be handed in before 4 p.m.

The Hon. Secretary-General's room is at the College of Physicians, on the ground floor, at the right-hand side of the staircase.

A Reading and Writing Room is provided at the College of Physicians, where Members can see the Journals and write letters. Letters of Members may be addressed here during the Meeting of the Congress.

A Postal and Telegraph Office is situated on the left-hand side of the entrance to the courtyard of Burlington House, Piccadilly.

Facilities will be afforded every day during the Session of the Congress, between the hours of 2 p.m. and 3.30 p.m., to Members desirous of visiting the London Hospitals and Medical Schools and their Museums. Special arrangements have been made for afternoon Hospital visits on Thursday, Aug. 4th, and Friday, Aug. 5th, when the Members of the Staff of each Hospital and School, so far as is practicable, will attend. The Officers of the Sections will afford information respecting visits which Members may desire to make to special Hospitals other than those mentioned in the Programme, or Institutions of interest to members of the Section.

Members of the Congress are admitted free, on presentation of their Tickets of Membership, to view the International Medical and Sanitary Exhibition at South Kensington, at which will be exhibited the various Materials and Apparatus employed in the prevention, detection, cure, and alleviation of disease.

SECTIONS.

The Sections will meet in the following places from 10 a.m. to 1 p.m. and from 2 p.m. to 3.30 p.m.

I. ANATOMY.—Linnæan Society's Council Room, Burlington House.
II. PHYSIOLOGY.—Royal Institution, Albemarle Street.
III. PATHOLOGY.—Chemical Society's Meeting Room, Burlington House.
IV. MEDICINE.—The Theatre, University of London, Burlington Gardens.
IV. DISEASES OF THE THROAT (Sub-Section).—Astronomical Society's Meeting Room, Burlington House.

V. SURGERY.—The Library, University of London, Burlington Gardens.

VI. OBSTETRIC MEDICINE AND SURGERY.—South-East Examination Hall, University of London.

VII. DISEASES OF CHILDREN.—Antiquaries' Society's Meeting Room, Burlington House.

VIII. MENTAL DISEASES.—The Asiatic Society's Meeting Rooms, Albemarle Street.

IX. OPHTHALMOLOGY.—Royal Society's Meeting Rooms, Burlington House.

X. DISEASES OF THE EAR.—The Assembly Room, Royal Academy of Arts, Burlington House.

XI. DISEASES OF THE SKIN.—Linnæan Society Secretary's Room, Burlington House.

XII. DISEASES OF THE TEETH.—Linnæan Society's Meeting Room, Burlington House.

XIII. STATE MEDICINE.—Royal School of Mines, Jermyn Street.

XIV. MILITARY SURGERY AND MEDICINE.—The Graduates' Meeting Room, University of London.

XV. MATERIA MEDICA AND PHARMACOLOGY.—Geological Society's Meeting Room, Burlington House.

MUSEUM.—Geological Society's Museum, Burlington House.

A Medal in commemoration of the Congress will be struck, and may be obtained by Members, at a nominal cost.

DAILY PROGRAMME.

TUESDAY, AUGUST 2ND.

10 a.m. to 6 p.m.—Registration of Members and issue of Tickets at the Office of the Reception Committee in the Royal College of Physicians, Pall Mall East.

3 to 6 p.m.—Reception of the Members of the Congress by the Executive and Reception Committees at the Royal College of Physicians.

WEDNESDAY, AUGUST 3RD.

8 a.m. to 6 p.m.—Registration of Members and Issue of Tickets at the Royal College of Physicians.

11 a.m.—First General Meeting, St. James's Great Hall.

Honorary Secretary-General's Report.

Address of Welcome by the Chairman of the Executive Committee.

Election of Officers, and Constitution of the Congress.

Election of Honorary Vice Presidents of the Congress.

Inaugural Address by the President of the Congress.

3 p.m.—Meeting of the Sections.

Constitution of the Sections.

And other business.

9 p.m.—Conversazione at South Kensington Museum (entrance Exhibition Road), given by the English Members of the Congress to the Foreign Members. Every Member of the Congress may, on this occasion, be accompanied by one lady.

THURSDAY, AUGUST 4TH.

10 a.m. to 1 p.m.—Sectional Meetings.

1.30 to 3.30 p.m.—Visits to Hospitals.

Guy's Hospital.
London Hospital.
St. George's Hospital.
St. Mary's Hospital.
St. Thomas's Hospital.
Westminster Hospital.

The Medical Officers and Lecturers will be prepared to receive such Members of the Congress as may desire to visit these Hospitals and to inspect their Schools and Museums.

2 to 3.30 p.m.—Additional Meeting Time for the Sections.

4 to 5.30 p.m.—Second General Meeting, Theatre of the University of London. Address by Prof. Maurice Raynaud, Paris, "Le Scepticisme en Médecine, au temps passé et au temps présent."

6.30 p.m.—Banquet given to a certain number of the Members of the Congress by the Lord Mayor of London, at the Mansion House.

FRIDAY, AUGUST 5TH.

10 a.m. to 1 p.m. Sectional Meetings.

1.30—3.30 p.m.—Visits to Hospitals.

Bethlem Hospital.
Charing Cross Hospital.
King's College Hospital.
Middlesex Hospital.
St. Bartholomew's Hospital.
University College Hospital.

The Medical Officers and Lecturers will be prepared to receive such Members of the Congress as may desire to visit these Hospitals and to inspect their Schools and Museums.

2—3.30 p.m.—Additional Meeting Time for the Sections.

4—5.30 p.m.—Third General Meeting, Theatre of the University of London. Address by Dr. Billings, Washington, U.S., on "Our Medical Literature."

Visit to Messrs. Penn's Works.

9 p.m.—Conversazione by the Royal College of Surgeons to the Members of the Congress.

SATURDAY, AUGUST 6TH.

10 a.m. to 1 p.m.—Sectional Meetings.

12.15.—Excursion to Croydon Sewage Farm.

2 p.m.—Excursion to Folkestone.

2 p.m.—Excursion to Hampton Court.

4—7 p.m.—Reception of a certain number of the Members at Kew Gardens by Sir J. D. Hooker.

4—7 p.m.—A garden party will be given by Mr. and Mrs. Spencer Wells, at Golder's Hill, Hampstead.

4—7 p.m.—A garden party will be given by Mr. Edwin Saunders, at Fairlawn, Wimbledon.

6.30 p.m.—The United Hospitals Club will entertain a party of the Members of the Congress at Dinner at the "Star and Garter," Richmond Hill.

SUNDAY, AUGUST 7TH.

10 a.m.—A *Service* will be held in Westminster Abbey; Sermon by the Very Rev. Dean Stanley, D.D., F.R.S.

3.15 p.m.—A *Service* will be held in St. Paul's Cathedral; Sermon by the Rev. Canon Liddon, D.D., D.C.L.

1.30 p.m.—Excursion to Boxhill. Visit to Sir Trevor Lawrence.

2 p.m.—The Royal Botanic Society's Gardens, and the Gardens of the Zoological Society, in the Regent's Park, will be open free to Members on this, and on every day of the week, on presentation of their Tickets.

The Royal Gardens at Kew may be visited on Sunday from 9 a.m. till sunset, and Hampton Court Palace and Gardens from 2 p.m. till sunset.

MONDAY, AUGUST 8TH.

10 a.m. to 1 p.m.—Sectional Meetings.

2—3.30 p.m.—Additional Meeting Time for Sections.

4—5.30 p.m.—Fourth General Meeting, Theatre of the University of London. Address by Prof. Volkmann, Halle, "Ueber Moderne Chirurgie."

Visit to the Docks.

6.30 p.m.—Dinner given to a certain number of the Foreign Members of the Congress by the Worshipful Master and Wardens of the Society of Apothecaries in their Hall in Blackfriars.

TUESDAY, AUGUST 9TH.

10 a.m. to 1 p.m.—Sectional Meetings.

2—3 p.m.—Fifth General Meeting, Theatre of the University of London. Address by Prof. Huxley, F.R.S., D.C.L., London, "The Connexion of the Biological Sciences with Medicine."

3 p.m.—Concluding Meeting of the Congress.

INFORMAL DINNER AT THE CRYSTAL PALACE.

After the Concluding Meeting the Members, accompanied by their Friends, including ladies, will proceed to Victoria Station, for High Level Station (London, Chatham, and Dover Railway), where special trains will be in waiting at 4 o'clock to convey them to the Crystal

Palace. After a visit to the Palace and Grounds an Informal Dinner will take place in the Concert Room, about 7 o'clock. At dusk the Fountains will play during a display of Fireworks, which may be viewed by Members of the Congress from the Queen's Corridor.

The Address of the Hon. General Secretary is William MacCormac, Esq., 13, Harley Street, Cavendish Square, W.

CLUBS.

The following Clubs are, by the courtesy of the Committees, open to such Foreign Members as shall inscribe their names in the book lying for the purpose at the Office of the Reception Committee, at the Royal College of Physicians:—German Athenæum, 93, Mortimer Street, W.; Hanover Square Club, 4, Hanover Square, W.; Société Nationale Française, 20, Bedford Street, W.C.; The Science Club, 4, Savile Row, W.

INTERNATIONAL MEDICAL AND SANITARY EXHIBITION.

THE International Medical and Sanitary Exhibition will be held at South Kensington, in the buildings contiguous with the Gardens of the Horticultural Society, from July 16th till August 13th. The Exhibition will comprise everything that is of service for the Prevention, Detection, Cure, and Alleviation of Disease. Certificates of Merit will be awarded.

The Dental Section will be in the Western Gallery, entrance from Queen's Gate. Messrs. Ash, Jamieson, Rutterford, Smale, White, and the Dental Manufacturing Company, are among the intending exhibitors.

The Judges appointed are George Ibbetson, F.R.C.S., Edwin Saunders, F.R.C.S., and Chas. S. Tomes, F.R.S.

Members of the International Medical Congress will be admitted free.

EXAMINATION PAPERS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Examination for Diploma in Dental Surgery, June 24th, 1881:—

ANATOMY AND PHYSIOLOGY.

1. Describe the course and distribution of the Arteries and Nerves which supply the teeth.
2. What are the changes which the Food undergoes in the Mouth and Stomach?

SURGERY AND PATHOLOGY.

1. Describe the causes, symptoms, and appropriate treatment of Ununited Fracture of the Lower Jaw.
2. What is meant by "Abscess of the Antrum"? How does it differ from common abscess, such as occurs in the cellular tissue? Give its symptoms, and the treatment which is generally adopted.

DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe the Crowns of the following Permanent Teeth, viz.:—upper central incisors, lower bicuspids, first molars, upper and lower;

make special mention of those peculiarities of form which predispose to Caries.

2. Give a general account of the Dentition of Snakes: explain the mechanism by which they are enabled to swallow large objects: describe the special contrivances found in the Teeth of Poisonous Species.

3. Describe specimens 1 and 2 under the microscope; and state the manner of formation of the structures under observation.

DENTAL SURGERY AND PATHOLOGY.

1. What are contour fillings? What is the rationale of their employment? Describe the relation of two contiguous teeth to each other, in a perfectly normal arch, pointing out the methods by which overcrowding of teeth tends to their destruction.

2. Explain the nature of Dentigerous Cysts; give their symptoms, diagnosis, and treatment.

3. Describe the operation of pivoting a recently fractured tooth. Mention the difficulties and complications ordinarily encountered.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

The following questions were given at the written examination for the Dental License in April last:—

ANATOMY.

1. Enumerate the ligaments, cartilages, and synovial membranes of the knee joint.

2. Describe the femoral ring; give its position, formation, use, and relation to blood vessels.

3. Mention the relative position of parts found on dissection between the digastric muscle and the line of the lower jaw.

PHYSIOLOGY.

Mention the different modes, physiologically speaking, in which death may take place.

CHEMISTRY.

1. What is Cyanogen, and how is it prepared? Mention its principal compounds, giving the formulæ according to the new or the old notation.

2. How are the Salts of Barium, Strontium, Calcium, and Magnesium distinguished from each other?

3. Mention the tests for Copper, Zinc, Mercury, and Gold.

SURGERY.

1. What are the characters of poisoned wounds, as regards (*a*) the wound, (*b*) the complications? Enumerate the poisoned wounds generally met with in practice. Mention the indications for treatment.

2. In cases of injury of head, give the symptoms of concussion and compression of the brain.

PRACTICE OF MEDICINE.

1. Give the diagnosis of Mitral and of Aortic regurgitation. What general and medical treatment would you adopt to improve the muscular tone of the heart?

2. Describe the different varieties of Hæmoptysis, and the appropriate treatment.

DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe the microscopic structure and characters of Dentine Enamel and Cementum in a human tooth, and state their probable uses.

2. What are the various sources of the buccal secretions, mucous and salivary? Mention the principal glands, and their situation, and state where their ducts enter the mouth.

3. Describe the Temporo-maxillary articulation, the structures entering into its formation, and muscles by which its movements are produced.

DENTAL SURGERY AND PATHOLOGY.

1. What is the condition of the gums and teeth in advanced Scorbutus? What causes produce this condition, and what are the principal modes of treatment?

2. What are the various circumstances of the mouth which may render the use of suction plates difficult or impossible?—Under what circumstances would you consider it justifiable to extract a sound tooth, and what tooth would you select for that purpose?

DENTAL HOSPITAL REPORTS.

Monthly Report of Cases Treated at the Dental Hospital of London.

From May 1st to May 31st, 1881.

Extractions	Children under 14	574
	Adults	738
	Under Nitrous Oxide	341
Gold Stoppings		231
White Foil ditto		22
Plastic ditto		473
Irregularities of the Teeth treated mechanically		90
Miscellaneous Cases		357
Advice Cases		192
	Total	3018

H. G. Blackmore,
House Surgeon.

Monthly Report of Cases Treated at the National Dental Hospital.

From May 1st to May 31st, 1881.

Number of Patients attended			1349
Extractions	Children under 14		362
	Adults		552
	Under Nitrous Oxide		61
Gold Stoppings			89
Sheets of Gold used, independent of Pellets		95	
Other Stoppings			512
Advice and Scaling			97
Irregularities of the Teeth			55
Miscellaneous			98
	Total operations		1826

R. Desmond Ashby,
House Surgeon.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

"UNITED WE STAND—DIVIDED WE FALL."

To the Editor of the DENTAL RECORD.

SIR,—Some weeks ago an advertisement appeared in the *Dental*, and in most of the Medical journals, inquiring for a gentleman to fill the office of dental surgeon to the General Hospital, Birmingham. In this advertisement it was stated that the *laws require* that the dental surgeon shall be an L.D.S. of the R.C.S. Eng., and *also* a member of one of the Royal Colleges of Surgeons of the United Kingdom. In order, it would appear, to soften this demand a note is affixed, that in case the applicant is not a member of any College of Surgeons, twelve months will be allowed him for obtaining the M.R.C.S. degree.

During the past month an advertisement has also been addressed from Middlesex Hospital, stating that a vacancy exists for the newly-created office of assistant dental surgeon, and that candidates must be registered medical practitioners, and also possess the L.D.S. Eng. diploma.

A third vacancy is now announced; a dental surgeon is required for the Dental Hospital of London, and in this instance also the membership of the College of Surgeons, with the L.D.S. is alone admissable.

What is the use, I would inquire, of making the Dental License the recognised dental degree if those possessing it are debarred from holding office, either in a general or a special hospital, without possessing the membership also? I am quite aware that in several instances lately dentists have been elected to some of our large institutions whose only qualification has been the L.D.S. Eng., and I am also aware that in many instances these gentlemen have been elected in preference to others possessing the M.R.C.S. diploma. The one qualification which appears to me most needed is the experience which may be gained at a dental hospital, for without this experience all technical education is barren and unprofitable. It does appear to me that those in authority are trifling with the youth of England when they tell them that the Dental Certificate is the qualification of experience, and the one most needed for a dental surgeon. In all the three appointments I have named, the various committees are screening themselves behind old bye-laws, enacted before the Dental Licentiateship was instituted, and these regulations should now be swept away, and a made dentist—that is, one possessing the L.D.S.—be considered most fitted for election.

You are commencing a new journal, to which I wish every success, and this might be a favourable moment to answer the question asked on all sides,—"What qualifies a man for dental responsibility in our institutions?" If the curriculum as set down by the College of Surgeons of England is insufficient, by all means let it be augmented; but do let us understand what answer to return to the parents of the rising generation, and to medical practitioners generally, when they ask the question, what constitutes a qualified dentist?

Yours, &c.,

Montague Place, Russell Square. FELIX WEISS.

NATIONAL DENTAL HOSPITAL.

To the Editor of the DENTAL RECORD.

SIR,—Permit me to make known through your columns that all Members of the International Medical Congress are cordially invited to inspect this Hospital, which will be open daily from 9 a.m. to 7 p.m. during the Session.

Yours, &c.

National Dental Hospital, ARTHUR G. KLUGH, *Sec.*
149, Great Portland Street, W., *June 24th*, 1881.

GENESIS.

The birth of The Dental Record is hereby revealed. Begotten out of Knowledge by Necessity, nurtured in embryo with Thought and Care, we bring into existence a journal stamped with Energy. That its life shall be vigorous and progressive, and not a mere flicker to suddenly fly upwards, numerous members of the Dental Profession have already, even in the short space of a few weeks, not only given us promises of nutriment, but, in several instances, have those promises been fulfilled, and many communications of interest are to hand. Give us a continuance—we would even ask for a further increase—of the very favourable support we have as yet received, and the monthly pulsations of the Editor will supply the profession with a long-felt desideratum. We cater for the Dental Profession, and if members will support us with their contributions, correspondence, and other items of news, their want, in the form of a really good Dental Journal, shall be supplied.

The value of periodical literature does not depend upon the Editor, but rather upon the successful efforts of many willing writers. Columns have been provided for every form of communication, and they who do not take advantage of such cannot have any grounds for complaint. Our pages are, as stated elsewhere, open to everything possessing literary merit; and, while we thus endeavour to meet the requirement of the mass of the profession, the cravings of the more scientific and advanced we shall constantly strive to supply with intellectual pabulum.

Our principles of guidance are to extol the right, and fearlessly denounce that which is wrong; to maintain the necessity of the education required by the Dental Curriculum and for the License as the qualification of the Dentist—other degrees, either in Medicine, Surgery, Science, Art, or Literature, being to the Dental License additional qualifications. We do not pander to any individual or party feeling, but endeavour to recognise and ever uphold the noble, the good, and the true, to the furtherance of the welfare of the Dental Profession.

ANNOTATIONS.

We shall be glad to receive the name of any gentleman who is open to prepare candidates for the Dental Examinations of the several Corporations. Application for such information has frequently been made to us.

Dr. W. Finley Thompson has been invited, and has kindly consented, to give a Clinical Demonstration on Operative Dental Surgery, at the offices of the Dental Manufacturing Company, on Saturday, August 6th, at 2 p.m.

Mr. Verrier, of Weymouth, has sent us a very nice specimen of continuous gum work. He has lately been devoting attention to perfecting a new furnace for this process, and we hope, shortly, to have the opportunity of giving full details of it.

GOSSIP.

The report of the Nomination Committee of the Royal College of Surgeons of England was adopted at the meeting of the Council, held on Thursday, June 9th. The Committee recommend that, 1. The Nomination Committee shall consist of seven members of the Council, together with the President and Vice-Presidents, and not less than three members of the Committee shall be, or shall have been, members of the Court of Examiners. 2. The duties of the Nomination Committee shall be as follows, viz.—*a*. To consider applications from candidates for the offices of examiner in anatomy and in physiology, in medicine, in midwifery, and for the dental section of the Board of Examiners in dental surgery; to report thereon to the Council; and to recommend the candidates deemed fittest for election. *b*. To be visitors of the examinations in anatomy and physiology, in medicine, in midwifery, and in dental surgery. *c*. To make representations and recommendations to the Council respecting the aforesaid examinations. 3. The members of the Council appointed members of the Nomination Committee shall be ineligible for any of the before-mentioned examinerships.

On the 10th of May a waiter amused himself by throwing a sixpenny piece into the air, intending to catch the coin in his mouth, but it disappeared. Vomiting was excited, but the piece was not rejected. Next day he had a paroxysm of coughing, and, when it passed off, he described a feeling of fluttering in his windpipe. The coin was evidently in his left bronchus. The patient was inverted, and a smart blow on the back dislodged the foreign body, and it fell from his mouth. Mr. Joseph Bell, F.R.C.S. Ed., under whose care the patient was, had prepared to perform tracheotomy in the event of the coin becoming fixed in the larynx or exciting spasms.

DR. EUSTACE SMITH, in an article on MILK-INDIGESTION IN YOUNG CHILDREN, published in the *British Medical Journal*, mentions that the chief obstacle to the digestion of cow's milk by young babies is the firmness of the clot formed by its coagulated curd. Mere dilution with water does not affect this property. Under the influence of the gastric juice, the casein runs together into a solid dense lump. To obviate this difficulty, we must either separate the particles of curd by adding barley-water or gelatine to the milk, so that the casein may be forced to coagulate in a multitude of little clots; or we must partially neutralise the gastric juice by the addition of lime-water.

M. FAURE, of Paris, recently charged a box with electricity and sent it from Paris to Sir William Thompson, F.R.S., at the University of Glasgow. Some seventy-two hours were occupied in the transit of this box of "condensed lightning," there being stored up within the small space of one cubic foot a power equivalent to nearly a million of foot pounds. Prof. George Buchanan, of Glasgow, carried away one of the lead cells, weighing about 18 lbs., and, by transmitting some of its store of electricity through the platinum loop of an *écraseur*, removed a vascular tumour from the tongue of a boy in about a minute of time, and without loss of blood.

IN a paper recently read before the Royal Society on the Structure and Development of the Skull in Sturgeons, by Prof. Parker, it is stated that Larval Sturgeons have, for a few weeks, their lips and throat beset with true teeth, which are moulted before calcification has fairly set in. This larval, or "embryonic," presence of teeth is interesting, inasmuch as the adult animal is edentalous.

THE twenty-ninth annual meeting of the Metropolitan Counties Branch of the British Medical Association will be held at the Crystal Palace, on Tuesday, July 12th, at 4 p.m.; dinner at 6.30 p.m. Edwin Saunders, Esq., in the chair.

THE inventor of celluloid has compounded a new material for buttons, boot-heels, &c. It consists of leather cuttings soaked in hot water, to remove oil, then dried, ground to powder, and pressed into moulds by hydraulic power.

A NEW work is in preparation on Pathological Dental Anatomy and Operative Dental Surgery, by Thomas Gaddes, L.D.S.Eng. & Edin., and W. Finley Thompson, M.D., D.D.S.

MR. EDWIN SAUNDERS, F.R.C.S., has been nominated President-elect of the Metropolitan Counties Branch of the British Medical Association.

IT affords satisfaction to observe that, in London, show cases of "dental art" are being toned down, and in many cases they have disappeared.

A MONUMENT is to be erected to the memory of the late Dr. Broca, the founder of the Anthropological Society of Paris; 14,000 francs have already been subscribed. Prof. Broca's "Treatise on Tumours" (Odontomes, &c.) is well known in Dental literature.

THE Post Office authorities have recently begun the employment of deaf mutes, as assistant paper sorters in the Savings Bank Department.

Mr. THOS. A. ROGERS, President of the Odontological Society, will entertain the Council of the Society at Dinner, at the Crystal Palace, to-day, the 1st inst.

Mr. EDWIN SAUNDERS, as President of the Dental Section of the International Medical Congress, will give a Garden Party to certain Members, at 4 till 7 o'clock, on Aug. 6th.

AT the Examination for the License in Dental Surgery of the Royal College of Surgeons in Ireland, held on the 27th ult., there were over one hundred and fifty candidates.

WITH the use of the electric probe, which rings a bell when it comes in contact with an impacted bullet, is the diagnosis of the surgeon materially aided in cases of gunshot injuries.

THE council of the Odontological Society will hold a conversazione on the evening of August 2nd, when it is proposed to give some clinical demonstrations.

A COLOSSAL pine, which was lately uprooted by an inundation at Pijhajoki, in Oulais, Finland, was found to have 1,029 annual rings.

HERR SCHUBERT has recently shown that the atomic weight of platinum, instead of being 197·2, is 194·46.

INTERCOMMUNICATIONS.

QUESTIONS.

(1.) WASTE FILLING.—Will some readers of the DENTAL RECORD give a hint as to the best mode of treating waste filling material.—A.Z.

(2.) ULCERATION OF FACE.—F. E. inquires, Can ulceration of face arise from decayed teeth?

Communications have been received from Messrs. James Stocken, Gilbert Walker, W. F. Thompson, F. Rose, A. B. Verrier, J. Shipley Slipper, Felix Weiss, A. G. Klugh, G. Ward. J. J. Musgrave, John Laws, Wm. MacCormac, A. G., F. E.

Books, &c., Received.

"Deformities of the Mouth;" by Oakley Coles. "The Origin of Millstone Grit;" by W. H. Goss, F.O.S., F.M.S.

All Communications for the Editor should be addressed to 25, Broad Street, Golden Square, W.

THE

DENTAL RECORD.

VOL. I. AUGUST 10, 1881. No. 2.

THOUGHTS—COMPARISONS—REFLECTIONS.

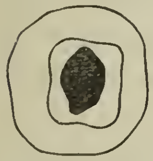
BY JOHN LAWS, L.D.S.I.

WILL it *save* my teeth? Is there a dental surgeon who is not almost daily asked the question? Yet who among us can conscientiously answer it with a certain affirmative? An anxious mother brings to us her daughter in her fourteenth year that we may examine her mouth. We do so, and find the full complement of teeth for her age, in fairly regular order, and clean. But we find deep cavities of decay on the masticating surface of each of the four first molars, extending to the buccal walls of the two lowers, anterior proximal cavity in the right upper second molar, proximal cavities in both centrals, one with the palatal wall broken, and large posterior proximal cavity in the right second lower bicuspid. Not a very encouraging state of things. Our examination over, we turn to the mother, who has been watching with dismay the frequent jottings on our examination card, and state the facts of the case to her. On being asked for our advice, and noticing that there is nothing in the structure or condition of the teeth to contra-indicate gold, we strongly recommend that they be all filled with gold and properly rebuilt to their normal shape, or as nearly so as is wise. Then comes the question of cost; and as we regulate our fees for stopping teeth according to the time occupied in each case, we say so, explaining at the same time that the cost will be considerable, as we could not undertake to perform the work efficiently under ten hours, and it might take longer.

This preamble is not imaginary. The mouth as explained, is one taken from my case book; the conversation as described takes place almost daily in my operating room. Now we come to the point from which we started: Will it save the teeth? How long can we guarantee the teeth will last should the patient decide to undergo the necessary infliction of long sittings, rubber dam, and painful manipulation, and long bills, which are imperative for the production of high class gold fillings? We cannot but feel humble at having to admit the impossibility of guaranteeing the salvation of any tooth. Show me the man, who, though he has been in the hands of competent dental surgeons all his life can, at 45 years of age, exhibit a complete and unbroken set of natural teeth. I grant that there are a few fortunate ones who do even to old age possess complete natural dentures, but they are not included amongst our *patients*, and most probably never sat in that hideous and complicated machine, a dentist's chair. Are we saving teeth then? or do we only postpone the inevitable evil day when they must be sacrificed to the forceps? and if so, could it not be done with a much smaller expenditure of time, pain, inconvenience and expense? Is there no other material at the hands of the dentist with which teeth can be stopped more easily, more quickly, with less paraphernalia, and with the same hope or chance of permanence as gold? Alas, that we should have to answer, No! Amalgam will not, gutta percha will not, the plastics will not, *i.e.*, with anything like the same hope of permanence as gold. Here, again, what cause for humility, after all our years of research, experiment, and boasted advancement, we are still compelled to assign the first and highest place in our category of filling materials to the metal used by our forefathers—gold—a body than which it is perhaps impossible to find any substance more foreign to the nature and structure of our natural teeth, or the contents of the mouth. Well may the disciples of the "New Departure Creed" talk of the "Incompatibility of Filling Material with Tooth Substance," so long as we are obliged to turn our patients' mouths into gold mines or caskets filled with expensive and glistening, yet all unsightly jewels, whose staring brilliancy keeps their owners in perpetual dread of attaining that height of human happiness, a hearty laugh.

The assertion I have just made with respect to amalgam, &c., will be considered by many practitioners to be too sweeping, as I have met with several who hold that, conditions being equal, if the same skill and careful manipulation be exercised in the insertion of amalgam as gold, it equals gold as a preservative filling. Some four or five years ago I held this opinion myself, now I unhesitatingly assert that no filling material we yet possess can approach gold for the saving of teeth. The virtue is not in the material itself, but in its wonderful working qualities—soft or hard, tough or brittle at will; in fact, we can command it and manipulate it to almost any extent, so as to be able to say of it as of no other filling material, "Our will, not thine, be done." Here we have the secret of success in saving teeth with gold, viz., its marvellous manipulative qualities, utterly devoid of shrinkage or expansion, soft enough to be placed in the minutest crevices, yet, at will, hard enough to endure the severe strain and friction of mastication—in short, it has the supreme virtue of *remaining where it is placed*, and not surprising and humiliating us by shrinking in one's mouth so as to allow fluid to enter the cavity, or expanding in another so as to split the enamel, or mysteriously rising above the edges of the cavity, or dissolving out of sight altogether.

In order to compare and prove to myself the different qualities of our various filling materials, I some time ago adopted a plan of selecting a mouth in which were to be found four cavities as nearly alike in position, condition and surroundings as possible, and filling each cavity with a different material. For instance, in one case, I selected the mouth of a young lady, aged 17, in which all the teeth were sound save the four six-year molars, in all of which there were rather deep crown cavities. I excavated and cut them all as nearly as possible to the same shape as represented in figure. The right lower I filled with gold cohesively, the left lower with Robertson's Standard Amalgam, the right upper was filled with Fletcher's Porcelain, the left upper with Sullivan's Cement. I used these four named materials, believing each to be the best of the class to which it belongs. In each case the rubber dam was used, and I endeavoured to exercise the same care and attention to manipulative details with each material, finishing each stopping with as high a polish as it is capable of attaining. After rather more than eighteen months' wear, the result is as follows:—The Porcelain has failed both to save the tooth from further decay, or to stand the wear of mastication; the tooth containing Sullivan's Cement is almost as black as a piece of coal, there is no sign of further decay, but the surface of the filling exhibits that silvery grey tint peculiar to Sullivan, when being worn by friction or mastication; Robertson's Standard Amalgam is as bright and good as when inserted, except that at the posterior edge of the cavity decay was proceeding; the gold alone remains perfect, not a spot of further decay in the tooth, not a blemish of any description in the filling, a monument to its own pre-eminence as a filling material. This example is a typical one of others I have been making in order to arrive at genuine comparisons between the qualities of our many filling materials, and to satisfy myself as to which is the best, and on which I can most confidently rely. And yet, is gold a perfect filling material? No; but about as far from it as east is from west; it is undoubtedly the best we yet possess, but that best is but a sorry makeshift, a ghastly usurper. All honour to those men, both at home and abroad, who have spent long years in study and experiment to try and find out a better, even though as yet they have failed. All honour to Fletcher, whose efforts, though not yet successful, are still worthy of the highest commendation, even though he may have marred his fame by premature assertions; all honour to Flagg, though he may be partially wrong, for he has made our old



men speak out, and our young men hesitate and think ere they accept as infallible the dogmas of their teachers.

Would that the example of such men could stimulate the whole profession to think, and work, and experiment more and more, even though a thousand failures be recorded with scarcely one success, till at length is brought forth a material which can be used as a filling, with at least the same hope of success as gold; which shall not be a substance so utterly foreign to the natural organs as metal is; which shall not discolour or look unsightly in the mouth, but match the shade of the teeth it is used for; which can be manipulated with the same certainty as gold, but in half the time or less, hence not so expensive a material; in fact, one which, when placed in the mouth, will not be observed, will rival the monster Gold in the salvation of teeth, and will not terrify our patients by painfully-prolonged sittings or exorbitant expense.

A *perfect* filling material! Can such be produced? or must we for ever bow our heads to the wisdom exhibited in the choice of our forefathers, and continue all our lives to be able to do nothing better for our helpless patients than build up for them, at an enormous expense of time and money, one of the most delicate organs of the system with a staring yellow metal, thereby making hideous what was before beautiful; making a visit to the dentist dreaded with a dread more intense than words can express, and violating the first principles of conservative Surgery, by substituting for lost tissue a substance, which, in place of being as nearly like the original as possible, has no affinity with anything contained in the human organism, but is totally and altogether foreign to it, viz., Metal?

REPLANTING TEETH.

By J. S. Crapper, L.D.S.I.

As this subject is at present exciting some attention, the following cases may not be uninteresting, as they serve to show what may be done by this mode of treatment:—

(1). Some time ago I had an American lady under treatment. Most of her teeth had been filled with gold, with the exception of an anterior upper bicuspid. In this was found a cavity situated on the buccal surface extending above the cervical edge far under the gum, and not too brilliantly filled with amalgam, and a further examination disclosed the existence of an alveolar abscess. The filling was removed, and the abscess treated for some time unsuccessfully, and as the patient had never lost a permanent tooth she was naturally very desirous of saving this one. I therefore resolved to replant it. The tooth was removed with difficulty, some portion of the outer alveolar border (which was very thin, and adhered firmly to the tooth) coming away with it. To add to the trouble, cavities were discovered on each of the approximate surfaces, and a hole (evidently the result of an accident during some previous treatment) was found at the side near the apex of the fang. The cavities, nerve canals, &c., were carefully filled with gold, the fang having been previously shortened; it was then thoroughly washed in dilute carbolic acid (one in twenty), and the socket having been cleansed with the same, the tooth was pressed firmly home, after being out of the mouth nearly four hours. The following day the tooth was found to have elongated; a vulcanite inter-dental splint was applied, and surrounding gum freely lanced. It gradually settled down, and when last seen the sinus had disappeared; the gum assumed a healthy appearance, and the tooth was firm and useful.

(2). C. S., of Stoke-upon-Trent, aged 35, called upon me on June 13th, suffering from acute neuralgia arising from extensive decay in the posterior portion of the second left upper molar. The pulp was in a state of suppuration, and, giving rise to periostitis, I resolved to extract and replant. The tooth was extracted painlessly under the influence of nitrous oxide gas, the pulp cavity opened up and, along with the root canals, thoroughly cleared out; the apex of the roots were filed down, and the canals were filled with thin osteo, then the tooth was carefully filled with gold, and the socket well cleansed with dilute carbolic acid (one in twenty). The tooth was then firmly replaced with very little pain to the patient, having been out of the mouth for careful treatment for over two hours. He was requested to call again the next day, but so little did the tooth trouble him beyond a slight soreness, that he allowed five days to elapse before he again presented himself. Nature had evidently in this short time come to the rescue, for the tooth was becoming firm. The gum was treated with tincture of iodine for a few days; and when I last saw him, viz., on Thursday, July the 14th, the tooth was perfectly firm, and entirely free from pain, and he expressed his great gratitude for having a tooth saved which he had considered as irretrievably lost. When it was suggested to replant, he thought for the moment it was only a joke.

I have taken this opportunity of relating some of my recent experience in replantation, with the anticipation that other members of our profession may be induced to record any interesting cases that may come within their notice. It is well known that several eminent men have tried replantation with equal success; and I trust the cases now given may act as an incentive to those members of our profession, who have not yet tried, what appears to me to be, a valuable system of Conservative Dentistry.

BOOK REVIEW.

Deformities of the Mouth, Congenital and Acquired, with their Mechanical Treatment. By Oakley Coles. Third Edition. London: J. & A. Churchill.

(*Continued from page* 23.)

Regarding the causes of the several classes of deformity mentioned by Mr. Coles, he is unable to explain the origin dolichoid (long) and brachoid (short) jaws. Intermaxillary prognathism is asserted to be the result of an excessive developmental force originating in the body of the sphenoid bone, and, being transmitted through the nasal septum, carries the pre-maxillary bones forwards. Our author bases this assertion on the following observed facts:—

> "First, the true case of intermaxillary prognathism will have a long thin nose. Secondly, this long thin nose is not observable during the first dentition, nor is the prognathism, excepting to a very slight degree indeed. Hence we may conclude that the long thin nose and prognathous jaw are capable of intensification by growth and development during early life. Thirdly, it has been shown that the measurement from the interbicuspid line to the incisive angle is greater in the prognathous than in the normal jaw: hence it follows that the change from the normal arch occurs at a point anterior to the second bicuspids, whilst the second bicuspids are known to correspond with the position of the second molars of the milk dentition. Thus it is shown that the prognathism is not of the whole jaw carried forward on a horizontal plane, but is really intermaxillary or alveolo-sub-nasal in its character. Fourthly, it is simply a logical sequence of the process that produces intermaxillary prognathism, carried a step further in embryonic life that produces double hare-lip and fissured alveolus."

This hereditary prognathism, Mr. Coles distinctly asserts, is, when occurring among the highly-civilised, a distinct mark of deterioration of stock. That may be. But it is altogether unwarrantable to say, and certainly "straining the argument unduly," if we assume that "man by deterioration returns to the type of the higher apes." That man arose from the higher apes is the popular idea of Darwinism. The doctrine of descent, as taught by Darwin and others, does not give any such theory of man's origin; but rather, that man and his nearest allies—the higher apes—have an ancestoral origin in common with one another, and that man does not stand in the direct line of development from the ape. Therefore, it is impossible for man, by retrograde development, to return to the form of that which, it is maintained, he never sprang from.

The deterioration of stock, which prognathism is said to distinctly mark, our author avowedly asserts to be a degeneration of form and physique; and he also implies that it is likewise an indication of mental deterioration. Physical and cerebral development may progress simultaneously, but, as Mr. Wallace has pointed out, there comes a time when, in the human subject, at all events, the factors of evolution lead to a cerebral development out of proportion, and even detrimental, to that of physique. The corollary is significant: morphological deterioration, as applied to the animal form, does not necessarily imply psychical retrogression. This conclusion, as it bears upon individuals with prognathous and V-shaped maxillæ, is in accord with not only frequent observation, but also with the remarks of Dr. Kingsley, who writes:—"Cases are so common where such deformities are found associated with the highest order of intelligence that, if we are to draw any inference from that condition in the abstract, we should say that it was more likely to indicate a precocity of mental development, with a stimulated emotional nature in the child, and possibly a more brilliant intellect in the adult."

Of the Lambdoid, or V-shaped jaw, "there seems sufficient evidence to justify the belief that premature ossification of the sutures is the rule in the majority of these cases; and we may, therefore, assume, if we cannot absolutely conclude, that this influence operates powerfully in the production of the deformity."

Intermaxillary hypognathism, more extended observation will probably show, is the result of "a scrofulous tendency on one or both sides of the ancestral tree. As the influence of excessive growth of the sphenoid is considered as the cause of the prognathous jaw, so we must not discard the results likely to ensue from an arrest of growth of the sphenoid in cases of pre-maxillary hypognathism. More especially as we find the flat arch of the brachoid jaw associated with inherited syphilis, and the crowded arch of the hypognathous jaw occurring in the subjects of well-marked Rickets."

In individuals with the hypognathous jaw, it may here be remarked, the lower jaw does not partake of the deformity, but in profile rather appears, probably from the small premaxillæ, to be excessively developed, and frequently the incisor teeth protrude beyond, and do not articulate with the upper incisors. The fact of the lower jaw not being arrested in its growth in hypognathism is also an argument in favour of the sphenoid being the regulator of this form of premaxillary development.

It would also have given satisfaction if Mr. Coles had treated of the malformations of the lower jaw. This being, as it were, a free arch, the forces which act upon the upper jaw do not necessarily influence the mandible.

The relation between the physical outline of the cranium and palate receives attention in Chapter VI., and several tracings are given in illustration of the subject. Here is pointed out that in palatal deformity, in strongly-marked malformation of jaws, and in interference with the mechanism of speech, there is unsymmetry of the cranium. This want of symmetry, or flattening, Mr. Coles has, in a number of cases, found to be most marked on the left side, and on this side of the brain are the language, speech, and sound centres situate. "And it has already been shown that congenital structural defect of the brain is frequently associated with physical deformity of the skull, so may it be useful to regard the conformation of the skull as part of the evidence by which we may estimate the development of the brain, especially in regard to those points to which attention has been drawn in this chapter."

"If it be possible to avail ourselves of the facts that are stated, and the inferences that are indicated, we may be able to prognose with a greater degree of certainty the future language and speech capacity of sufferers from palatal and maxillary deformity of a congenital origin."

The last seven chapters treat of the appliances for remedying cleft palate and other deformities of the mouth and face. The book is written in an easy style, and is well illustrated with 86 lithographs and 93 wood-cuts and outline diagrams. It is in every way an improvement upon the former edition. Mr. Coles is to be congratulated on the successful production of the third edition of a work which is of considerable scientific value, and places the etiology of the subject in an advanced position. There is a great amount of original investigation recorded, and the book is worthy of a place in every dentist's library, and does credit to the license in dental surgery.

T. G.

DENTAL HOSPITAL OF LONDON MEDICAL SCHOOL.

The Annual Distribution of Prizes to the successful students of this school took place at Willis's Rooms, on June 30th, Professor Owen, F.R.S., occupying the chair. The Dean, Mr. T. F. K. Underwood, read his report as follows:—

At our prize distribution last year I was glad to be able to say that the universal depression of the preceding year was wearing off, and that we were again moving steadily forwards, and I expressed a hope that by the present time the London School of Dental Surgery would be in its normally flourishing condition. My expectations have been fulfilled; the school is now thoroughly up to its work, and I hope that my report will show that we are not only aware of what we ought to do, but that we are efficiently carrying out the scheme of education and relief for which we exist. The entries for the winter and summer sessions, the latter of which is now rapidly drawing to a close, were nearly equal to the best year we have ever known, and as the quality and quantity of relief given must depend largely upon the number of students to administer it, the prosperity of the school is of the utmost importance to the poor among whom our work lies. For it must always be remembered that it is quite impossible for even general hospitals, much more special ones, to grapple thoroughly with the disease and suffering around us. At the best we can hope to relieve very partially the sickness which is so widespread in London. The examinations at the College of Surgeons, which are held three times a year, of course deprive us from time to time of the services of the more advanced students; but as long as the entries exceed the drain upon us, we have plenty who are only too glad to step in and fill up the places oft hose whose term of study is over. I have great pleasure in stating that of the twelve candidates whom we sent up for the examination just over, every one has passed, and I venture to say it is not often that a medical school can show a pass list of 100 per cent. Among the newly-fledged licentiates stands pre-eminent Mr. W. Hern, whom you will have so often before you that you will be in no danger of forgetting him. He is Saunders Scholar for 1881, and this means that he is the most distinguished student of his year, of which fact you will have full proof shortly. The exertions of our medical tutors, past and present, have largely contributed to the exceptionally good pass list, and while we have lost the valuable services of Mr. Storer Bennett as medical tutor, we have retained him among us as assistant surgeon. Mr. Morton Smale, formerly a distinguished pupil of this hospital has been appointed to fill his place. The commencement of his work in preparing men for the late examination is a very auspicious beginning and augurs well for the future. Our demonstrator, Mr. Claude Rogers, has proved himself so valuable that we have determined to appoint a second demonstrator to share the work, and Mr. John Ackery, also a distinguished pupil and a late house surgeon, has accepted the post. With two such officers, the staff feel the burden of teaching greatly lightened, and we think that we have now done our utmost to secure the most thorough and systematic instruction in our branch of surgery. In the place of Mr. Makins (late lecturer on metallurgy) and of Mr. Turner (late lecturer on mechanics) we have been fortunate enough to secure as their successors respectively, Mr. Louis and Dr. Walker. The former gentleman is well known in the chemical world, and the latter (Dr. Walker) needs no introduction from me. He was one of the first officers of the hospital at its foundation. On the surgical staff we have to regret the resignation of Mr. Bartlett, who for very many years held the office of assistant surgeon, and of Mr. Ashley Gibbings, both old students here. In their place Mr. Storer Bennett and Mr. Arthur Underwood have been appointed. It is right that I should take this opportunity of mention-ing the valuable help the staff have received during the past year from our successive house and assistant house surgeons. These posts are filled by senior students, who are selected from the best men of their year to discharge these duties. Mr. Bradshaw our late, and Mr. Blackmore our present, very able and indefatigable house surgeon, together with Mr. Rees Price and Mr. Curle, the late and the present assistant house surgeon, deserve our very sincere and hearty thanks for the excellent and efficient manner in which they have been and are carrying on the work of the hospital, and I am particularly grateful to them for the way in which, while they retain their popularity, they assist me in maintaining its necessary discipline.

The valuable scholarship founded by Mr. Edwin Saunders, and bearing his name will be presented to Mr. W. Hern, who has fully justified the hopes I expressed of him last year. He has proved himself thoroughly worthy of bearing the honour which we are gratified in being able to bestow upon him. Mr. Hern showed every evidence from the beginning of what he meant to do, for he gained two first-class prizes, though only in his first year, and he has also carried off I am afraid to say how many, prizes at Middlesex Hospital.

Mr. Buchanan, of Glasgow, still continues his generous gift to us of an annual prize of five guineas for an essay, the subject of which you will see upon the prize list, and there are few present, I think I may safely say, who have not at some time felt a very practical interest in it. Every year we hope that Mr. Buchanan will be with us the next, but although we are of a very hopeful disposition we begin to despair of seeing him.

The Student's Prize for their own society will be awarded, together with the prizes of the Medical School. It is gained by Mr. J. S. Amoore, the Saunders scholar of last year, and one whom most of our friends will recognise as a prizeman with a large capacity for honours.

The prize for Operative Dental Surgery has been awarded to Mr. Curle. The examination extended over three days, and embraced the treatment of irregularities, extractions under anæsthetics, and stoppings —three of the most distinctive points in Dental Surgery.

And now, as my report has been longer than I could have wished, I will bring it to a close, only saying that I think our prize list shows evidence of work well done; and if examinations are worth anything (and there are some who would fain persuade us they are not) our programme shows that we are keeping up our old prestige, and that our prosecution of the scientific study of this branch of surgery keeps pace with real relief given from very real pain which it is our privilege and duty to afford. Finally, on behalf of my colleagues and myself I must express the pleasure which it gives us to see so many kind friends here to-day. To the ladies our thanks are doubly due, and we beg to tender them our grateful acknowledgments. I can vary our usual invitation to our visitors to see over the hospital by saying it is undergoing repairs, and is, I am sorry to say, through the dilatoriness of the workmen, scarcely in a fit condition to receive our friends.

Professor Owen then delivered Prizes to the following successful students:—

The Saunders Scholarship to Mr. W. Hern, Scholar for 1881.

Mr. Buchanan's Prize to Mr. J. S. Amoore, for Essay on "The Causes, Symptoms, and Treatment of Neuralgia in connection with Diseases of the Teeth."

Mechanical Dentistry:—Mr. W. Hern—1st Prize; Messrs. J. O. Butcher and W. Harrison—2nd Prize; Mr. J. M. Ackland, 1st Hon. Certificate.

Metallurgy:—Mr. J. J. Andrew—1st Prize; Mr. S. C. Buckland—2nd Prize; Mr. J. O. Butcher—1st Hon. Certificate.

Dental Surgery and Pathology:—Mr. W. Hern—1st Prize; Mr. W. A. Turner—2nd Prize; Mr. A. Alex. Matthews—1st Hon Certificate; Mr. S. C. Buckland—2nd Hon. Certificate.

Dental Anatomy and Physiology:—Mr. W. Hern—1st Prize: Mr. A. Alex. Matthews—2nd Prize; Mr. S. C. Buckland—1st. Hon. Certificate; Mr. W. Harrison—2nd Hon. Certificate; Mr. J. M. Ackland—3rd Hon. Certificate.

Prize for Operative Dental Surgery to Mr. Curle.

Student's Society Prize, 1880, awarded for Paper on "The Dentition of the Mollusca," to Mr. J. S. Amoore.

The distribution being concluded, Professor Owen delivered the following address:—

Mr. DEAN and GENTLEMEN,—The dental system of organs, in relation to which your hospital and special school exist, having been the subject of some of my biological labours, I accepted with pleasure the invitation to perform the agreeable duty which I have just discharged, and I felt honoured by the request of your President and Council in relation thereto. When at work in the great School of Comparative Anatomy, at Paris, more than half a century ago, the prevalent notion of the nature of teeth was that they were mere secreted products. De Blainville, who commonly differed from Cuvier, agreed with him in this, and even expressed more decidedly that low view of their nature and structure: with him teeth had no organic connection with the pulp or part secreting them.

The microscopic demonstrations of the organisation of the chief dental constituent recorded by Leeuwenhoek in the 140th of the publications issued in 1670 by our Royal Society, the predecessors of our present "Philosophical Transactions," was neglected and forgotten.

The confirmation, by Purkinje in 1835, of the tubular structure of the substance now known as "dentine," and the modifications of dentinal structures made known by Retzius in 1837, and since extended by the exact and persevering labours of your accomplished associates, Messrs. Tomes, father and son, have placed the parts of the human frame which are your special subjects in the category of structures, in relation to which every advance in their anatomical and physiological history becomes, as in every other system of organs, the foundation of successful practice—of those conclusions as to the various maladies you are called upon to relieve or cure, known in other departments of the healing science as "diagnosis" and "prognosis." And there will be no surer sign that dentistry has risen to the status of a science than the fulfilment of your predictions and concomitant practice in cases of disease and abnormality of the teeth.

The direction of my dental studies having been, partly, to the diagnosis of extinct animals, I am bound to testify to how large a measure of help and light I have been indebted to the study, especially microscopical, of fossil teeth; how richly they demonstrate the structures through which the vital fluid percolates the dense tissues, both in plasmigerous channels too minute to admit the coloured blood-discs, and in those of a size yielding as rich a display of vascular, blood-carrying organisation as in the bones themselves.

Palæontology has, moreover, brought to light evidences of dental armatures in a vertebrate class hitherto held to be definitely characterised by toothless jaws. True it is that some birds present tooth-like serrations of the corneous sheaths of the beak; and, in the typical *Raptores,* the maxillary prominence, with the sharp piercing sheath it supports, is called in falconry the "tooth" of the hawk. In the petrified skull of an eocene bird, from Sheppey, I found a series of the bony supports of such weapons as truly merited the name of teeth: and better evidences of teeth implanted in sockets have been demonstrated in the extinct birds of an older geological period, discovered by Professor March, in North America.

Thus no great natural group of vertebrates refuses to supply you with modifications of the dental system. Nor need you deem a sacrifice of business hours, or adventurous journeys far a-field, essential to the acquisition of subjects enabling you to make original additions to odontological knowledge.

These few sections showing the organisation of teeth in some old and low forms of extinct life, I have been led to bring as evidence of what may be discovered without the need of exploring wilds in which the scalp of the collector was hardly safe from the tomahawk of the Indian, but which may reward the application of an otherwise idle hour, passed by a comfortable fireside, during an "evening at home."

Pick up and scrutinise with your pocket-lens any fresh fragments of coal that may have fallen from the shovel upon the hearthstone. If you discern a speck of brighter colour than its black environment, rub the surface showing it, flat enough to be cemented to a plate or "slide" of glass, if that can be done without obliterating the speck. Then turn the opposite side to the whetstone, and carefully rub down your bit of coal till it is thin enough to let light through your "speck." In such a slide you may see in what looks, at first sight, like a then plate of mere coal, when put under the microscope, a tooth of perhaps novel form, with crown and root; the former may be defined by a coating of enamel, and the dentine may show a rich vascular organisation—the iron of the blood of the old carboniferous fish, or batrachian, imparting the colour that defines the channels along which it was conveyed. Results of such examinations of sections of coal I shall have the pleasure of exhibiting at the close of the present address.

Teeth are organs that, as a rule, have a term of existence more limited than that of the organism of which they form a part. In many of the lower vertebrates the life of teeth is short; they are shed, comparatively, soon after they are completed and in use; but they are quickly replaced by others, and this so frequently as to suggest their analogy to the moulted parts of higher animals, such as *feathers* and *hairs*. In mammals there is but one succession in the case of teeth naturally shed; and the successors of the so-called "milk teeth" last long enough to have got the name of "permanent teeth"; but they are rarely retained in much advanced age. Now these commonplaces will, I hope, be condoned as introductory to what I ask leave to tell you in relation to the belief, entertained by many, of the occasional acquisition of a third set of teeth in human centenarians.

Of late the statements of extreme longevity, such as that ascribed to Old Parr, Old Jenkins, and the Countess of Desmond have been carefully sifted, especially by my friend Mr. Thoms, and I concur with him, that physiological science does not possess a duly and credibly authenticated instance of human life having been prolonged in the individual beyond the period of a hundred and five years.

I was led into a discussion on this point by a worthy clergyman, at the table of a friend whom I was visiting; and to my scepticism as to the alleged age and third set of teeth of the old Countess,* he replied that there then lived in his parish an old woman, alleged to have passed her hundredth year, who was actually cutting "her third set of teeth." I rejoiced at this instance; I had long been convinced that actual phenomena had suggested the statement, but that their nature had been misinterpreted, and I deemed myself most fortunate to have an opportunity of testing the case in question.

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* "In our time the Countess of Desmond lived to the age of a hundred and forty years, and not many years before she died she had all her teeth renewed."—*Fynes Morison's Itinerary*, 1617.

The following morning I was driven to the old woman's cabin. It was in the north of Ireland. She was sitting and crooning at her peat fire—a most typical example of human decay. To the shouts of her pastor the deaf old crone replied by pulling down her skinny lip, and exposing the side of her lower jaw, from which there projected through the gum the blackened stump of a tooth, the crown of which had gone probably many years before. The absorption of the alveolar processes, consequent on the edentulous state of the jaw in senility, had brought to light this remnant of a long-lost tooth. Other stumps of teeth, of which the loss of the decayed crown had been forgotten, might, in like manner, appear through the shrinking and absorption of the senile jaw, the parts of which, lodging such stumps, are not removed in the same degree as the truly edentulous portions.

This I take to be the true ground of the allegations as to the acquisition in extreme old age of a third set of veritable teeth.

A great proportion, indeed the chief part of medical science and art, is devoted to restoring the normal action of parts and organs, the abnormal working of which manifests itself in the various symptoms of as many maladies. Whilst the surgical branch of the healing art perfects itself in a power of removing, with safety to life, some part of the frame which cannot be brought back to a condition to perform its allotted function.

To many, perhaps, the most remarkable and striking examples of curative and alleviative skill is the substitution of artificial organs, or helps for organs and structures which are worn out, or removed, or from any cause fail to do the work assigned to them in the living organisation. Very ingenious and useful substitutes for amputated limbs are now supplied by surgical mechanists. The aurist invents his ear-trumpets; he adds to the relatively small conch of man an instrument rivalling in power, and resembling in proportion, the produced external ears of certain quadrupeds. The oculist adapts his spectacles and eye-glasses as supplemental corneæ, or lenses, to all the various degrees and kinds of defective vision, and, after removing a part of the wonderful organ of sight, supplements the lost crystalline lens, by an artificial collector and condenser of the rays of light. Nay, when the case is such as to necessitate the excision of the entire eyeball, he can replace it with an artificial one, which, if it does not perform the function, supplies the place, of the lost organ, and can only be detected after close scrutiny to be a humanly-manufactured substitute for a mechanism which the Theologist adduces, above all organs, in vindication of a purposive and adaptive Creative Cause.

To the department of the healing art, to which your hospital is devoted, belongs, in perhaps a greater degree, the achievement of substituting, for created organs, the artificial ones which best supply their place, and execute their functions. Whether it be to restore the enamelled gems which complete the charm of the Fair one's face, or the more business-like organs which effect the preparatory process of the all-important function of digestion, you, by common consent, are acknowledged to have brought this part of your speciality to perfection. I feel bound to testify, and to gratefully acknowledge that I never possessed a dental system, at any age, which so completely, so agreeably, and so painlessly performed its functions in every relation—whether as to outward appearance, or as aids to speech, or as preparatory digestive organs—as these substitutes for the natural teeth which I have lost, and to which I bade adieu, perhaps ungratefully, with pleasurable relief, when the seat and cause of agony was gone.

In availing myself of this substitution I am utterly unconscious of the presence of a foreign body, or that I have any other armature of jaws than those that originally formed a natural integral part of my framework. You seem to me to have rivalled—even surpassed—the mechanism which, through the operation of the developmental forces, I originally possessed; and I have comfortable assurance that not one of my present incisors, canines, or molars will ever give me cause to groan at toothache.

A vote of thanks to Prof. Owen, proposed by Mr. Erichsen, and carried unanimously, terminated the proceedings.

BRITISH DENTAL ASSOCIATION.

The second annual meeting of this association was held at 40, Leicester Square, on August 1st. Mr. John Tomes, F.R.S., President, occupied the chair.

The Treasurer's report showed that for the half-year the receipts had been £556 6s. 10d., and the expenses £219 16s. 7d., and that there was a balance of £600.

The Secretary reported that the society consisted of 412 members, and he considered the meagre support which the association had received, a disgrace to the profession. The numerical strength of the association was to be augmented by the Western Counties Dental Association becoming a branch of the British Dental Association.

The following gentlemen were elected members of the Representative Board, viz.:—Messrs. E. Saunders, Coleman, Sewill, Ibettson, Bowman-Macleod, R. E. Stewart (Liverpool), W. H. Woodhouse, Hutchinson, Gibbings, Adams Parker, Mahonie, Nicol (Leeds), R. Hepburn, A. Hill. Mr. Campion (Manchester) was elected President-elect.

It was decided that the next annual meeting of the association be held in Liverpool, a warm invitation to that city having been received from the President of the Liverpool Medical Association.

The President delivered his address, and, having alluded to the history of the Dentists Act, he discussed the more recent action of the Medical Council in regard to the opinion of counsel, and the unsatisfactory decision arrived at upon the questions of practising dentistry *bonâ fide*, and in conjunction with pharmacy, and also upon additional qualifications, as mentioned in Section 11, Clause 6. He said they had no complaint against the Medical Council, but they had reason for disappointment. That was mainly grounded upon the fact that the Dental Committee of the Council, in their finding as to the facts of the cases submitted to them, had no evidence or advice from dentists as to what constituted dentistry. One distinguished member of that committee considered dentistry as nothing more than tooth-pulling, and he seemed to hold a high opinion of a barber's ability in the practice of that branch of surgery. The Executive Board of the association had again submitted a case to counsel, and obtained the opinion of Sir John Holker, Q.C., M.P., Mr. R. S. Wright, and Mr. G. A. R. Fitzgerald. The first question was, "What is the true construction of Sub-section (C) of Section 6, *i.e.*, is Sir F. Herschell right or wrong in his opinion?"

The opinion received was,—"The 6th Section of the Dentists Act, 1878, enacts that 'any person who . . . . (C) is at the passing of this Act *bonâ fide* engaged in the practice of Dentistry, or Dental Surgery, either separately or in conjunction with the practice of Medicine, Surgery, or Pharmacy . . . . shall be entitled to be registered under this Act."

"We are of opinion that the words 'practice of Medicine, Surgery, or Pharmacy,' refer to legal practice of these professions by duly qualified persons. Even if this were not the natural meaning of the words taken by themselves, we think they must receive this interpretation under Section 34 of the Medical Act of 1858 (21 and 22 Vict., chapter 90) in the case of Medicine and Surgery, and under Section 12 of the Pharmacy Act, 1852 (15 and 16 Vict., chapter 56), and Section 1 of the Pharmacy Act, 1868 (31 and 32 Vict., chapter 121), in the case of Pharmacy.

"We are further of opinion that persons who at the passing of the Act practised Dentistry, at the same place in conjunction with another business or profession (not being Medicine, Surgery, or Pharmacy, as above interpreted), are not entitled to be registered under the Act. In each case it will be for the Council to decide, as a matter of fact, whether the person's real business was Dentistry. They would not be precluded from so finding merely by the circumstance that he occasionally, or incidentally, or at some other place, carried on another business; but a person whose real business was that of a blacksmith, watchmaker, or veterinary surgeon, would not in our opinion be a person who was '*bonâ fide* engaged in the practice of Dentistry or

Dental Surgery,' within the meaning of the Act, merely because he added to that business the practice of Dentistry."

The second question asked,—"If wrong, what is the best mode of proceeding to obtain a judicial decision on the Section?"

To that the following opinion was given:—"We think that practically the only means of obtaining a judicial decision will be for the Council to expunge from the register the name of some person who, according to the view which we have taken, was not entitled to be registered. The question can then be tried on a mandamus to restore the name. The Council would no doubt be prepared to give every facility for this purpose."

The President considered that a very satisfactory result, and that it justifies the action taken by the Association. They had thereby placed the Medical Council in possession of additional legal opinion, and the subscriptions and the guarantee fund shows the determination of the profession to carry out the last advice of counsel. He was of opinion that one hundred qualified men added to our ranks each year will suffice to keep up the strength of our profession.

It was stated that the guarantee fund would receive from the Western Counties Branch a further sum of about £90. The meeting also pledged itself to use its best endeavours to raise sufficient funds to obtain an opinion in a court of law upon cases of alleged incorrect registration.

Some other business having been completed, and there being no paper to read on account of the Congress, the meeting terminated.

WESTERN COUNTIES DENTAL ASSOCIATION.

The third annual meeting of this Association was held in Bristol, on Saturday, July 30th, the President, George T. Parkinson, Esq. L.D.S.Eng., in the chair.

The following is an abstract of the report of the Council:—

When the Association originated, it was the only one of the kind, although the British Dental Association, the second general meeting of which was to take place in a few days in the metropolis, was then in an embryonic condition.

The subject of the relationship of this Society with that of the Central Association was discussed at the last meeting in Bath, and a resolution, "that the Western Counties Dental Association should be affiliated with the British Dental Association" was unanimously carried, with the understanding that the President and Secretary for the time being, should be *ex officio* members of the Council, and should be delegates and members of the British Dental Association.

This the Council has taken into its consideration, and arranged that its report and transactions should be published free of cost in the Journal of the Association, of which all members shall receive copies, whilst those who are members of the British Dental Association shall receive the Journal during the whole year.

The Council, therefore, finds the principal source of material expense removed, and is prepared to recommend that the subscription to this Association shall henceforth be reduced to five shillings to all who are members of the British Dental Association.

The influence of the Society is becoming strengthened; and the members of the profession who reside within the counties of Gloucestershire and Hereford, are desirous of adding those districts to the counties already embraced within the limits of this Association. The Council, therefore, recommends that Gloucestershire and Hereford be added to the Western Counties Dental Association, and that the gentlemen proposed by their delegate, R. Rogers, Esq., at the Council held in Plymouth, April 16th, 1881, shall be declared members of this Association.

The subject of advertising has been brought to the notice of the Council by various members, and it is with extreme regret the Council finds that among the various advertisements sent to it are some from licentiates in Dental Surgery; who, although morally and professionally pledged by the laws of the Medical Colleges to refrain from thus degrading the profession, yet use this means of dishonouring themselves, and lowering the whole body politic. Only one member of this Society has, so far, departed from the rules of the Association, and he has gone to reside beyond the limits of the Society.

The advertising system is indirectly considerably increased by the custom and influence which some of the leading and most honourably intentioned members of the medical and dental profession adopt, in too readily writing certificates and recommendations of the value of advertised articles. It matters not whether it be a new chair or an old footstool, a pulp-destroyer or a pain-killer, a new modelling composition, or an old instrument revived, &c. If Mr. Anybody recommends it, without even the composition or construction being fully known, he does that in a manner which encourages the more open advertiser to try the like if he finds it answer his purpose. Not only is this the case with some of the leading members of the profession, but it is worked to a great extent by some of the Dental depôts.

Not long since a notice was issued to the profession generally, offering to supply to any extent a small publication, to which the name of any professional man might be placed on the title-page as author, for broadcast distribution. This the Council believes was printed in America; thus the low and degrading influence which prevails too largely in Transatlantic practice, is endeavouring to be extended amongst us, and added to that which already lowers the status of the Dental profession in England.

To a certain extent it does appear to your Council, that much power exists with the Association as a body, to arrest and lessen, if not to wholly overcome, such procedure. In the first instance, the Society should be true to itself, and strictly, as a high sense of honour, adhere to its bye-laws. In cases in which it can exert an influence, either directly or morally, it should do so by passing a resolution, advising the members of the Society, as a body, to refrain from dealing with any such advertising medium. With regard to those members of the profession who incautiously write letters approving of this or that ware or nostrum, it is the urgent request of the Council of this Association, that those who have been in the habit of so doing, will refrain in future, in accordance with an expressed wish of this Society, bearing in mind that those articles which are so extraneously recommended, are often of the least permanent value, and it is universally experienced that a really good thing will best recommend itself.

The members now enrolled have reached the goodly number of sixty-six; and the Treasurer's report shows a balance of £19 3*s.*

The following is a list of the officers of the branch for the ensuing year:—

President—Thos. Cooke Parson, M.R.C.S. *Vice-Presidents*—G. T. Parkinson, L.D.S.E.; C. Spence Bate, F.R.S., L.D.S.E. *Treasurer*—J. T. Browne-Mason, L.D.S.E. *Local Secretary*—Alfred Smith, L.D.S.I. *Hon. Secretary*—W. V. Moore, L.D.S.E.

Council:—F. H. Balkwill, L.D.S.E.; Richard Brown, L.D.S.E.; R. S. Coles, L.D.S.I.; S. Bevan Fox, L.D.S.E.; R. H. Geldard, L.D.S.E.; W. Hunt, L.D.S.E.; W. A. Hunt, L.R.C.P.L., &c.; C. A. Hayman, L.D.S.E.; E. E. Jewers, L.D.S.E.; H. A. King, L.D.S.I.; W. Helyar, L.D.S.I.; Charles Gaine, M.R.C.S.; H. B. Mason, L.D.S.E.; M. Magor, L.D.S.E.; R. P. Morrison, L.D.S.I.; G. W. Pearman, L.D.S.E.; A. Smith, L.D.S.I.; W. R. Tuck, L.D.S.E.; D. Watson, L.D.S.E.; F. Youngman, L.D.S.E.; C. N. King, L.D.S.I.

Mr. G. T. Parkinson having retired, the new President, Mr. T. C. Parson, occupied the chair, and delivered his inaugural address, of which the following is a short abstract:—

A retrospective glance at the history of Dental Surgery cannot fail to impress the mind with one consideration, viz., the marvellous development of science and art in providing for the not less wonderful and rapid increase of Dental diseases.

We are accustomed to consider our profession as having no history, but perhaps we have to some extent made up for the lack of antiquity by the celerity of our progress. Distinct records concerning nearly all kinds of Dental operations can, however, be traced back to the middle of the eighteenth century. Long before John Hunter's invaluable works appeared, one Thomas Beadmore (Member of the

Surgeon's Company, and Dentist in Ordinary to His Majesty) published a 'Treatise on the Disorders and Deformities of the Teeth and Gums,' explaining the most rational methods of treating their diseases.

In about 1778 John Hunter gave to the world the fruit of many years' patient and laborious research. In reading his work on the 'Natural History of the Teeth,' one cannot help perceiving the mark of a true genius animated by a sound and self-renouncing philanthrophy.

Considering the enormous increase of Dental disease, the question naturally arises, How is it? Can any intelligent reason be assigned for its early appearance and extensive prevalence amongst all classes of the community? The concurrent progress of caries with civilization is admitted on all hands. The jaw of the Zulu or aboriginal Australian presents no traces of this malady. The teeth may be worn down, even to the edge of the gum, by constant grinding of the unground maize, but no chemical action of the fluids of the mouth is visible, the ravages of fungus growths are not present. The degeneration and early destruction of the wisdom teeth in European skulls, as compared with those of uncivilized tribes or the anthropoid Apes, is also an admitted fact. Another curious observation has just been made. Dr. Beddoe and Mr. Tuckett state that the average British head is undergoing a steady diminution in size, amounting to three-quarters of an inch, during the last twenty-five years, as shown by the circumferential measurement of hatters. These facts all seem to show that civilization is tending to a deterioration in the structure and build of the human frame, and nothing leads to this conclusion more surely than a consideration of the details of the processes by which the teeth are destroyed.

Having reviewed the principal points in the anatomy and physiological activity of Dentine, he passed on to the consideration of the nature of Dental caries.

The daily life of the Dental Surgeon is calculated to lead to a too mechanical idea of the changes associated with caries; he must of necessity treat the disease from a mechanical point of view, and he may forget to look deeper into the early development of the disease he has to treat with a view to the prevention of its cause, rather than the mere dealing with a fully-developed lesion. Time and the inherent difficulties in dealing with patients, who only seek our assistance when driven by pain, prevent that close examination of the first symptoms of the disease which is necessary to enable us to take such measures as would lead to its prevention or amelioration.

The development of Lister's system of Antiseptic Surgery, carrying with it almost of necessity a belief in the germ theory of disease, has revived Pasteur's idea that the air we breathe is pregnant with life, and that under suitable conditions these germs will develop in animal fluids and solids, producing one of the varieties of fermentation and putrefaction. This theory, as applied to the teeth, has been fully elaborated by Ficinus and Klenke, and more recently in a work by Leber and Rottenstein. As a result of the belief in the universality of germs, and their power to set up putrefactive processes, has arisen the idea that germs are all important in the production of Dental caries, that the leptothrix and other parasitic fungi are the principal cause of the decay of abraded Dentine.

Attempts have also been made to prove that the decay of tooth structure is simply a question of chemistry, that the same changes may be observed in a dead tooth as in a living one (Tomes), and that acids of various kinds are the all-important agents in the breaking down of Dental structure.

That acids are essential to the disintegration and removal of the lime salts is an admitted fact, but that caries is something more than this most authors agree.

Mr. Spence Bate attributes caries to the action of carbonic acid, from decaying organic material of the tooth, and fresh supplies from the liquor sanguinis through the Dentinal tubuli.

Mechanical injury is considered by Salter as one of the sources of caries by exposing the Dentine, or by disintegrating the enamel and rendering it porous, the latter condition being found in crowded jaws.

The electro-chemical theory, as given by Mr. K. Bridgeman, attributes caries of the teeth to the action of voltaic electricity. These different causes, chemical, parasitic, mechanical, and other physical influences, such as changes in temperature, electrical variations, all, no doubt, have their influences; but over and above these influences there must be the vitality of the tooth itself, and this is the point he wished to direct emphatic attention to in my further remarks.

An important fact, showing the effect of vital influence on caries, is observed almost daily in families who grow up under our observation, that teeth which have been decaying rapidly up to the age of twenty-one, after that age have frequently a complete immunity from caries, which then take on the more chronic form. In some mouths, when the ravages of decay at one time threaten to destroy the whole denture, local treatment being totally inadequate to arrest the disease, a change takes place, and the caries is arrested, only, however, to commence again at a future time when the health gives way.

As evidence of the constitutional origin of caries may be mentioned the frequency of rickets and syphilis as predisposing factors.

In adult life the tendency to caries during pregnancy illustrates the dependence of the process on mal-nutrition. 'For every child a tooth' is a common proverb.

The effect of chronic dyspepsia and of prolonged anæmia on dental structure are further illustrations of general defects in the physiological nutrition of tissue.

Papers were also read on the following subjects:—*The Physiology and Pathology of Dental Caries*, by C. A. Hayman, L.D.S.Eng., Bristol; *Continuous Gum Work*, by A. B. Verrier, L.D.S.I., Weymouth; *Injecting Process of Celluloid*, by J. H. Gartrell, Penzance; *Treatment of Disease in the Dentine*, by W. V. Moore, L.D.S.Eng., Plymouth; *Cohesive and Non-Cohesive Gold Filling*, by the President, Thos. Cooke Parson, M.R.C.S.; *The System of Professional Fees*, by R. Rogers, L.D.S.I., Cheltenham. The following resolution was also carried:—"That this Society shall henceforth be a Branch of the British Dental Association, and shall be denominated 'The Western Branch of the British Dental Association,' that the fee to those who are Members of the British shall be 5*s.* instead of 10*s.* 6*d.* to the Western Counties Dental Association, and that the Officers of the British and Midland Associations shall be ex-officio Members of this Association."

INTERNATIONAL MEDICAL CONGRESS, 1881.

The first General Meeting of the International Medical Congress was held in St. James's Hall, on Wednesday, August the 3rd, His Royal Highness the Prince of Wales, and His Imperial Highness the Crown Prince of Prussia being present. After an address by the Chairman of the General Council, Sir William Jenner, the reading of the Hon. Secretary's Report, and the transaction of other formal business, Sir James Paget, the newly-elected President of the Congress, took the chair. The Prince of Wales declared the Congress open, and Sir James Paget then delivered his address.

The first meeting of Section XII. (on Diseases of the Teeth) was held at 3 p.m. on Wednesday, August 3rd, Edwin Saunders, Esq., F.R.C.S., President.

The President rose and said: In strict fulfilment of the programme issued by the Executive Committee of this Congress some months since, our section opens at the appointed hour. The rules which have been drawn up by the Committee for our guidance are, for the most part, those which govern all deliberative assemblies in this country, and therefore need not be reiterated.

He then proceeded to deliver the following address:—

INAUGURAL ADDRESS BY THE PRESIDENT OF SECTION XII.,

Edwin Saunders, F.R.C.S.

Gentlemen,—Before assuming the duties and responsibilities of

President of the Odontological Section of this great Congress, permit me to thank you for the honour you have conferred upon me in electing me to that high office; and let me assure you that it will be my earnest endeavour to justify your choice, however I may fail to satisfy my own, and your, well-warranted expectations. And, indeed, were it not that I am sustained by the kind co-operation of two Vice-Presidents and a Secretary, in whom our profession feels a just and legitimate pride, I might well feel oppressed by the onus of doing full justice to the position on so august an occasion. Nor was it, I am free to admit, until I had the permission of the Executive Committee to call around me, as a Council, some old and tried associates in professional work, that I began to experience the requisite energy and confidence. And having made this personal avowal and confession, I turn to the distinguished company before me, who have done us the high honour to visit our too great, but not too gay, capital, and to become for a short time, and for our signal profit, our guests at this great intellectual banquet. (Et à vous Messieurs les Étrangers, je viens, au nom des Membres Anglais du Congrès, au nom de nôtre plus grande Société, La Société Odontologique de la Grande Bretagne, au nom de la profession même en Angleterre, vous souhaiter la bienvenue. Croyez Messieurs, que nous sommes très sensible a l'honneur que vous nous avez fait en visitant a ce moment, notre trop grande mais trop gaie ville de Londres et croyez que c'est notre désir de vous rendre la visite, a une fois, agréable et fructueuse.) Permit me, gentlemen, on behalf of the English Members of the Congress, on behalf of our largest society, The Odontological Society of Great Britain, now in the 25th year of its somewhat chequered, but, on the whole, prosperous existence, and on behalf of the whole body of the Dental profession in England to offer you a hearty welcome, and to assure you of our earnest desire to render your too brief visit both profitable and pleasant. We hail the happy occasion of our friendly intercourse, and we trust that friendships begun under such benign auspices may continue and progress in interest through many prosperous years. Such gatherings as these, with the pleasurable amenities they involve, do much to soften and refine the manners, to quicken the intellect of all concerned, and to remove misconceptions of national or individual character which are apt to be engendered by isolation and want of friendly intercourse. Congresses such as that at which it is our privilege at this time to assist, serve a great social purpose, apart from the intellectual and scientific aims at which they are more immediately directed. It is much that they afford an opportunity and a stimulus for intellectual effort, which might otherwise, with man's proverbial procrastination, never be called into action. But in these days of an ever teeming press, and of facilities for the free intercommunication of ideas, this is subordinate to the advantage of personal knowledge of the individual, and the living change of thought. The modern Congress which seems now in high favour owes its existence, or shall it not be said, its revival, to the intellectual activity, joined with a wide eclecticism, which is a characteristic of our times, and which seeks to assimilate to itself whatever is of value in the past, or in other lands, whether in social manners and customs, in matters of dress or daily life, in schools of architecture, or in the realms of science or art. The generally accepted idea of a Congress is, if I mistake not, more than a fortuitous assembly of persons engaged in similar pursuits and drawn together by community of thought and interest. It is the deliberate coming together of distinguished men or of experts; of set purpose and for a specific object; the persons constituting the Congress being invited and selected with a due regard to their knowledge of the subject, for the consideration of which it has been convoked. This is especially evident in political affairs, and notably in a recent instance in a northern capital, where the great countries of Europe, represented by their most distinguished statesmen and diplomatists, met in a solemn conclave for the rectification of national frontier lines, and for the determination of other questions of vital importance which must otherwise have been left to the rude arbitrament of the sword. And may we not indulge the hope, in the interests of an enlightened humanity, that this high function may be more extensively employed to interfere between the unbridled ambition and lawless rapacity of states, more powerful than just, and the resolute resistance to subjugation or spoliation on the part of the oppressed, protracted, it may be, to the bitter end, through years of carnage and misery? So might the world be spared the saddening spectacle of "man's inhumanity to man," and the fair page of contemporary history be unsullied by the foul blot of the blood-stained record. Ours, however, is a Congress of peace, and we are happily not called upon to compose animosities or to adjudicate upon conflicting claims. The triumphs which we are met to celebrate are those of man's skill in limiting and repairing the ravages of disease; our victories, those over nature herself, when she is forced to yield up another of her secrets as the reward of patient research or of well-conducted experiment. Our international re-union may be regarded as a periodical taking stock of the gains of science, of improved appliances, of more accurate means of diagnosis, and of more efficient modes of treatment in the various departments of medical practice. And for the better and fuller carrying out of this intention, it has been found advisable, having regard to the present advanced state of medical and surgical science, to divide the work of the Congress into sections.

These sections carrying on their work simultaneously, and the work of each section being complete in itself, greater fulness and accuracy of detail are secured without any sacrifice of the unity of the one grand result, as the work of each section is the necessary complement of the whole. In that with which we are more immediately concerned, one of the youngest departments of surgical practice, and which for the first time enjoys its own distinct and prominent position, considerable interest will attach to the question of education and the regulations which in each country govern the entrance into the profession. The former part of this very important subject will, I trust, shortly be brought under the notice of the Congress by one than whom none is at once more fully informed, and more entitled to speak with authority--I mean Mr. John Tomes—who has in this direction during the last quarter of a century done much to advance the interests, and to establish a strong claim on the gratitude of the profession. Nor would the English sense of justice and fair play be satisfied without an acknowledgment of the more recent services of his colleague in this good and great work, Mr. James Smith Turner, without whose unsparing devotion of time and energy it could not have been brought to so successful an issue. To the joint action of these two gentlemen, to the lawyer-like precision and forethought of the former, no less than to the vigilance and promptitude of the latter, is the profession indebted for that invaluable piece of legislation, the Dentists' Act of 1878. It must not be forgotten, however, that to our foreign friends the nature of the enactment is of greater interest than the means or the persons by whom it was obtained. By the provisions of this Act, then, which came into operation on August 1st, 1879, it is forbidden to anyone, to use the word Dentist, Dental Practitioner, or other title implying that he is qualified to practise Dental Surgery, unless his name appears on the Register of that body, thus giving to the Dentist the same protection and privileges as are enjoyed by the Physician and Surgeon in this and other countries. By this measure the opprobium was removed which so long rested on the Dental Profession in this country, that it included a large proportion of ill-qualified practitioners, and in many cases persons who were unsuccessful in other pursuits, and who were attracted to it by the absence of restrictions or of preliminary examination. By the provisions of this Act, introduced by Sir John Lubbock, not only are the public preserved from the extortion and malpraxis of the ignorant and unprincipled, but a grave discouragement is removed from the educated and honest practitioner. For it is only in human nature that high aims and honest zealous work should languish in the atmosphere of indifference and lack of appreciation. In thus obtaining legal sanction for the organization of the profession it was desired strictly to maintain its connexion with the Royal College of Surgeons, as it was rightly felt that separation from that body would involve abdication of the status which it had hitherto enjoyed. And when the college had been memorialised on the subject, showing that the curriculum for the diploma for general surgery, which was the only qualification then open to him, did not comprise certain matters of the first importance to the Dental Practitioner—that, in fact, the entire subject of Dental Surgery found no place either in the teaching or at the examining board, an arrangement was accepted for more fully meeting the requirements of the case. Accordingly a conjoint board of examiners, consisting of half surgeons and half specialists, was created for the licentiateship of Dental Surgery, with a corresponding modification of the prescribed course of study, eliminating much that was of little value and substituting what was regarded as specially necessary in that particular line of practice. Thus by varying but not lowering the educational standard an arrangement has been effected which, if not in all respects perfectly satisfactory, goes far to meet the reasonable views and wishes of those who have the welfare of the profession at heart. With this bare outline of our proceedings in reference to the organization of the profession before us we shall listen with interest to what has been accomplished in other countries in the same direction, not, it may be hoped, without mutual profit and advantage. Gentlemen, I feel that I ought not longer to tax your attention, but, having declared this section of the Congress open, that we shall prepare ourselves to listen with appreciation and enjoyment to those varied and valuable contributions to the literature of our speciality with which we are so liberally favoured both from home and foreign sources. And, first, your attention will be asked for the always welcome utterances of one whose contributions to science during a long series of years, many of them having a direct interest for our own speciality, and almost unparalleled for number and value, have made his name a household word in both hemispheres. I mean Professor Owen. We feel grateful for his presence here to-day, which will confer prestige on our proceedings, and we tender him with our thanks our sincere felicitations that he has been able to witness, in unimpaired health and energy, the realisation of his hopes and wishes in the completion of that noble structure, the Museum of Natural History.

ON THE SCIENTIFIC STATUS OF MEDICINE.

By Professor Owen.

Professor Owen pointed out the necessity of raising the study of Odontology to that of a Science, thereby elevating the status of the Dental Profession. He craved the indulgence of his audience while he, as one who had long ago ceased to practice a profession termed by the old Greek writers "divine," occupied their time. He alluded to the stereotyped principles of treatment in certain maladies, as dyspepsia, gastrodynia, peritonitis, pleurisy, pneumonia, etc., and, representing a case where all those conditions co-existed, the advanced medical man, instead of treating each condition, would seek for the cause, and by microscopic examination of some of the food taken, detect *Trachinæ spiralis.* In that way would he be able to give a true account of all the symptoms enumerated. Likewise, when finding trachinæ in food, some of which had been taken, would he be capable of predicting the conditions aud symptoms that would follow. His (Prof. Owen's) aim was to exemplify under what conditions medicine would be designated an Art, and in what it belonged to the higher altitude of Science. The scientific status of the profession is indicated by the terminology fully expressing the disease to which the name is applied. According to the degree in which uncertified dentists, chiropodists, and such like, flourished in that degree will the status of the inductive science of medicine be indicated.

[*THURSDAY, August 4th.*]

ON THE PRESENT CONDITION OF THE OPERATION OF REPLANTATION FOR THE CURE OF CHRONIC ALVEOLAR-PERIOSTITIS OF THE APEX OF THE ROOT.

By Dr. MAGITOT, Paris.

This communication gave the results of 100 operations undertaken for the cure of chronic alveolar-periostitis. These results were arranged in tables analyzing the 100 cases, and showing the age and sex of the patient, the tooth affected, the nature of the malady, its duration and the date of the operation, the extent of the resection practised, the time taken in consolidation, the time during which the result had been maintained, and, lastly, the different accidents which complicated the treatment. The results were established by the tables, and proved that chronic alveolar-periostitis was curable by replantation in 92 per cent. of the cases.

REPLANTATION. By W. FINLEY THOMPSON, M.D., D.D.S. [This paper will appear *in extenso*, and with illustrations, in our next issue.—ED.]

In the discussion which followed the reading of the two papers on replantation, Mr. C. S. Tomes read an abstract from an old book (Foot's "Life of Hunter") written at the time John Hunter was working at that subject. It was stated that a lady fell a victim to venereal disease through a tooth being transplanted from a syphilitic girl. Ulceration became manifest in the mouth and on all parts.

These and other syphilitic symptoms disappeared as the result of treatment with mercury, but the patient eventually died of hectic. The danger of communicating disease by transplanting teeth was by the writer considered as sufficient reason for his endeavour to banish from surgical practice such a mode of treatment.

Dr. TAFT (Cincinnati) said the subject of replantation was one at which many of them had been acting during the last few years, and there were many phases in their opinions. But theory must ever be secondary to practical points. The cases in which replantation should be performed were those where teeth are accidentally removed, and in obstinate cases of alveolar abscess, when failure of treatment in the mouth followed even their best efforts; also where chronic sinuses existed, and these were more common in the lower than in the upper jaw. In many teeth so affected there was a deposit upon the root, low down below the reach of scaling instruments. In every instance in which a healthy tooth in a healthy person was replaced he would expect immediate and permanent union. The treatment was more successful with the anterior teeth than with the molars, and this was due to the greater mobility of the molar teeth. He had seldom seen replanted molar teeth last more than four years, while he found the bicuspids last longer. What was the method of union? It was just the same as is made under any surgical operation; the reparation was of the same character. It was cicatritial tissue which formed the bond of union between the tooth and the alveolus. The presence of periosteum upon the root is valuable, but not essential to repair. He had seen cases in which it had been removed, and the tooth became quite firm, and continued to be so; and in one of those instances had the pulp vessels united, and the pulp lived.

Mr. COLEMAN stated that twenty years ago his attention was directed to replantation of teeth. There was nothing new in the mode of practice he then pursued, but perhaps it had this novelty, that, in the opinion of those who had gone before, a diseased tooth should not be replaced in a diseased socket. He dissented from that, and by the use of antiseptics he thought he might succeed, but his cases were failures. He next compared the operation to that of ovariotomy, in which all diseased tissue is removed; and in a much improved method of replantation Dr. Magitot removed all diseased structures. This procedure in replantation, and the principles of drainage which had been illustrated that morning, promised great success. The saving of teeth was merely a relative term, but if by replantation they could preserve a tooth for even one year that was an advantage.

Dr. ATKINSON (New York) said, when they understood the histological condition of the tissues represented in the diagrams Dr.

Thompson had placed before them, they will have advanced. They should avoid loading their memories with trash, but rather place nature before them. Young men should eschew books, and take nature, and seek for themselves truth. A question he would ask was, Are the lime salts held in solution in the embryonal tissue? It was such questions as that that they must understand before they could decide upon the subject of replantation of teeth.

Mr. BALKWILL (Plymouth) spoke of the conditions in which success may occur in cases of replantation, as, for instance, the form of the roots of front teeth. There were certain questions about which he had not yet been able to satisfy himself. He could understand the reunion of the periosteum, but the recommencement of the circulation in the vessels of the pulp had always been a matter of difficulty for him to realise. Of replanted teeth, in which the diseased periosteum had been scraped off, he had not had any personal experience, but he had observed several instances of absorption of the roots. One case, in which the periosteum had been scraped off, he had the opportunity of seeing several years after the operation. The tooth was firm, but the crown was carious. He excised the crown, and pivoted an artificial crown upon the root. At the present time, four years after the pivoting, the root is still quite firm.

Dr. ISZLAI JOZSEF (Budapest) related a case in which he, in extracting an impacted and irregular lower molar, accidently, though unavoidably, removed the second bicuspid. This latter he replaced, and two years after the tooth was firm, and as sensitive to heat and cold as were the neighbouring teeth. He said that in Bonn there is a specimen of a longitudinal section of a dog's jaw and tooth. The latter had been replanted, and the blood vessels of pulp are shown to be united and continuous with the trunk in the bone. Another similar case is in Berlin.

Mr. SPENCER BATE, F.R.S., said his first case of replantation dated back some thirty-seven years. In 1849 a patient had eight teeth knocked out; these he replaced and supported with a plate, and they did well. His experience differed from that of Dr. Magitot and others. He drilled through the alveolus into the cavity of the abscess, and did so with the greatest confidence of success. If the periodontium became separated from the root, his opinion was that no connection recurred, but necrosis followed. His opinion went dead against the practice of replanting in cases where extensive inflammation existed.

After some remarks from Mr. S. HUTCHINSON and Mr. BROWNE-MASON, the discussion ceased.

A paper was next read "ON EVIDENCES OF REFLEX ACTION IN

Relation to Constitutional Disturbance, induced by Interrupted Second Dentition," by Mr. D. Corbett, Dublin.

EXPERIMENTS ON THE ACTION OF AGENTS USED FOR THE DEVITALISATION OF THE DENTAL PULP.

By Dr. Arkövy, Budapest.

The author having referred to the paper on the subject by Dr. Coombes (Paris), stated that he had experimented upon dogs in the University of Budapest, and had found arsenious acid and pepsine useful in devitalising the pulp. On the application of arsenious acid to the pulp it changes into arsenic acid, and it undergoes change in the presence of hæmoglobin. It also causes inflammatory action and capillary emboli, and renders the red corpuscles pale and colourless. The tri-oxide is taken up by the blood vessels, and may be found within them. The fibres of connective tissue undergo no change, but the cells enlarge. The axis-cylinder of the nerve fibres becomes granular, tumified, and notched, and the neurilemma is also changed. There is an alteration of the whole pulp, and the peridental membrane is injected. No action was observed upon the dentine, save, in some cases, slight tumifaction of the fibrils.

Pepsine does not cause the red blood corpuscles to effuse their contents into the surrounding tissues, but they rather become darker in colour. It produces fatty degeneration of the capillaries, and also forms a distinct line of demarcation in the pulp to which it has been applied, while it is less likely to produce periostitis than arsenic.

A paper was then read on "Dental Surgery in the Army." By Thomas Gaddes, L.D.S.Eng. and Edin.

ON THE ADMINISTRATION OF ANÆSTHETICS AT THE DENTAL HOSPITAL OF LONDON, SINCE 1868.

By Alfred Coleman, F.R.C.S., &c.

Since the year 1868 anæsthetics had been administered within the walls of the hospital 20,000 times. In the majority of administrations nitrous oxide was used; next in order came æther, æther dichloride, chloroform, and other agents. Mr. Coleman prefers nitrous oxide and æther as an anæsthetic for those dental operations where a longer period of anæsthesia is desired than is obtained from nitrous oxide alone. No dangerous case had arisen that could be attributed to the nitrous oxide and æther; and in that large number of exhibitions only two cases had occurred in which there was any systematic artificial respiration resorted to.

[*FRIDAY, August 5th.*]

ON THE REPRODUCTION OF BONE, WITH ESPECIAL REFERENCE TO THE VARIABLE PORTIONS OF THE MAXILLARY BONES.

By Dr. W. H Atkinson, New York.

This paper included the following statements :—

Necrosis has been hitherto considered as sudden, but it is not so. Solution of the lime salts constitutes either caries or necrosis. The modern injunction is to remove all dead bone at once; do not, as the text-books say, wait until the necrosed portion is separated. The removal of the dead bone leaves a pocket which forms a receptacle for pabulum, and this is a *sine qua non* to bone repair. All tissue is produced from protoplasm Disease is one in origin and in mode, and has its production in debility.

There was no discussion.

Dr. Walker (London) opened a discussion on

THE PREMATURE WASTING OF THE ALVEOLI, AND ITS AMENABILITY TO TREATMENT.

He directed his observation to the normal production of bone after the extraction of teeth; the normal absorption of socket; and the normal absorption of the fang of a temporary tooth. Normal absorption essentially differed from the abnormal. Dr. Walker stated the hypertrophied condition of gum which exists in these cases consists of an increased amount of fibrous tissue, while the vascularity is decreased; also that the sub-acute inflammation of the gum passes into the bone and produces its loss. He exhibited some microscopic preparations, and two diagrams. One diagram represented effusion into the socket from which a tooth had been extracted, and the after-bone formation, with absorption crypts on the outer and inner surfaces of the alveolar margins. The other showed a section of tooth and jaw with the hypertrophied gum upon the bone.

Dr. Arkövy (Budapest) continuing the discussion, referred to the pathology and etiology of the disease known as Pyorrhœa alveolaris. He considered that from four to six times as many teeth were lost from that cause as from caries; and also, that the term pyorrhœa, as indicating a flow of pus, was neither a sufficient nor an expressive expression of the conditions which existed. He had directed special attention to the microscopical examination of the pus from such cases, and this he found to consist of pus cells, leptothryx, and other fungi. In all cases these fungi were to be found, many of which had fine processes extending from them. For this latter fungus he had not been able to find either a name or a classification. Other masses were present in the pus, and these contained great numbers of bacteria. In a solution of sugar and water containing a piece of meat, he found, after 48 hours, sphero-bacteria, with the same thread-like processes, and these he considered to be leptothryx. After three days, small sacs or cell-like bodies appeared ; and after seven days he found micrococci. Finally, he considered that the disease takes its origin from fungi.

Dr. Iszlai Joszef (Budapest) had followed in the same line of research as Dr. Arkövy, and found, not only leptothryx, but also mycalium.

Dr. Riggs (U.S.A.) disclaimed personal origin of the name frequently given to this disease—the term "Riggs's disease" having been ascribed because of his mode of treatment. He had been engaged for 40 years in investigating the disease, and he found it to be at first an inflamed condition of the margin of the gum, progressing to the bone, and leading to necrosis. The treatment was manipulative, not by acids and medicines. In his experience, 90 per cent. can be cured.

Mr. Walter Coffin (London) explained that his father's successful treatment of this disease was, in his opinion, the supplementing of a removal of mechanical irritation and conditions keeping up disease, by a very thorough antiseptic treatment with the strongest liquid carbolic acid applied locally only, and very exactly to the positions of purulent discharge between the tooth and its socket and the gum. He believed that Riggs's treatment bore to this about the relation that the *cleanly* treatment of wounds bore to real antiseptic surgery. The peculiar chemical reaction of Phenylic alcohol with the tissues saturated by the particular discharge of this disease, fully confirm, in his opinion, the septic theory of its origin, whether associated, or not, with the predisposing or aggravating influences of necrosis, calculus, or other causes.

Mr. Oakley Coles considered the disease as an expression of some general condition, and believed fungi to be secondary to, and dependent upon, the disease. The nodular condition of the tarter which was found upon the roots of the teeth so affected, arose from the deposit taking the impression of the cancellated bony socket.

Dr. Atkinson (New York) held as sound the opinion that the disease arose from constitutional debility. He deprecated the use of strong brushes, and advised the application of chloride of zinc—20 grains to the ounce of water—and good living.

Mr. C. S. Tomes cited a case of well marked disease affecting many teeth in one mouth. All the teeth were, from the circumstances of the case, extracted, and on many not a scrap of tarter was to be found.

DENTAL EDUCATION.

By John Tomes, F.R.S.

This paper was a long and exhaustive exposition of the entire scheme of Dental Education.

After some remarks from Dr. Butler, Dr. Atkinson and Dr. Shepherd, Dr. Rölliker said that in Germany they had no Hunter, Bell, Tomes, Cartwright or Coleman, Dentistry being yet in its infancy. Up to 10 years ago the profession had no status, but now those who begin the study of Dentistry must have a good general education. Yet "Dentist" was a term of opprobrium. They in Germany try to make their pupils dentists first and medical men afterwards.

Dr. Taft (Cincinnati) alluded to the schemes and efforts of Dr. Hayden, Dr. Harris, and others for advancing the study and status of Dentistry in the United States. The establishment of special dental institutions was the best thing that could be done, and the best thing, under the circumstances had been done. Now the doors of the Medical Colleges, which were at first closed, are open for the study of Dentistry, and the Medical Profession recognises the Dental Profession as one wing of the great healing army.

ON THE RESTORATION OF CONTOUR.

By Dr. Marshall Webb.

[*SATURDAY, August 6th.*]

AN INVESTIGATION INTO THE EFFECTS OF ORGANISMS UPON THE TEETH AND ALVEOLAR PORTION OF THE JAW.

By Arthur Underwood, M.R.C.S., L.D.S.Eng., and W. J. Mills.

The varieties of organisms most frequent in the mouth; the conditions favourable to their existence and proliferation; their chemical products; conditions which render their life impossible:—

1. The effects of organisms upon enamel.

2. The effects of organisms upon dentine. Their presence demonstrated by microscopical sections, in which the germs are stained with methyl violet. Their effects demonstrated by contrasting the destruction of tissue:—

(*a*) In teeth subjected to the action of acids under aseptic condition.

(*b*) In teeth subjected to the action of germs under excessively septic conditions.

Previous experiments upon the causation of caries investigated with the object of showing that wherever experimenters have succeeded in producing caries artificially, they have subjected the teeth to septic conditions, or where they have employed antiseptic agents (carbolic acid and creosote) they have not succeeded in producing caries.

3. The effects of organisms upon the surrounding tissues, alveolar abscess, the difficulty of maintaining a septic condition in the mouth. Eucalyptus oil and iodoform employed, results of their use—(*a*) In

alveolar abscess; (*b*) In dead roots; (*c*) In roots partially dead. Typical cases quoted; conclusion.

Observations were made by Dr. Taft, who considered germs and fungi secondary and not primary in the causation of caries; also by Dr. Atkinson and Mr. S. Hutchinson.

Mr. JOHN TOMES thought that until we had some better definition of dental caries, we should only provisionally accept the conclusions which this paper set forth, until something more decided was made out.

Mr. C. S. TOMES pointed out that these researches into the production of caries were the first experiments of the kind made since the results of Pasteur, Tyndall, and others were published. He drew especial attention to the fact stated in the paper, that if the germs be excluded from the solutions and teeth, they failed to produce the results illustrated, or find bacteria; but if the germs be admitted, they were to be found in dental caries.

Some further remarks were made by Messrs. Coleman, Spence Bate, and Oakley Coles.

ALVEOLAR ABSCESS.

By Dr. DEAN, Chicago.

Dr. DEAN stated that death of the pulp was a remote cause of alveolar abscess, while the immediate causes were various agents which find their way through the apical foramen. Abscess with sinus was most easy to treat, and readily brought to a successful termination. He ensures creosote reaching the abscess by first making patent the apical foramen, then places a little cotton with creosote in the pulp canal, and puts a bolus of soft rubber into the orifice of the cavity. Then, by pressing upon this elastic ball, the creosote is forced into the sac, and through the sinus.

Blind abscess he found more difficult of treatment, and preferred eucalyptus and phenol sodique. In stubborn cases aromatic sulphuric acid, though painful, is very effectual. The abscess not yielding to this treatment, an artificial fistula should be established.

Dr. WALTER COFFIN made some observations on the application of hydrogen dioxide to alveolar abscess. There was a sudden decomposition of the instable compound, with the evolution of nascent oxygen, which, by the pressure caused, was forced into the sac. There could be no more effectual application of an antiseptic than this, and he had found good results in the few cases in which he had used it.

CIVILIZATION, IN ITS RELATION TO THE INCREASING DEGENERACY OF HUMAN TEETH.

By Dr. NORMAN W. KINGSLEY, New York.

The most important problem now confronting the Dental profession is embodied in the daily parental inquiry: "Why are my teeth decaying more than did my father's or my mother's, and why are my children's teeth decaying at an earlier age than mine?"

This inquiry does not come to any extent from the lower classes of Society, or from those who are habitually neglectful of their persons, but does come from that class who are the most refined, intelligent, and cultured in the community.

The anxiety expressed is not groundless, but has sufficient cause to justify alarm. A prevalent idea among unprofessional people is that candy eating is the cause of decay in children's teeth, but the idea, in its broad application, is fallacious. Various theories have been advanced by professional observers from time to time, such as "living upon soft food," "living upon bread from bolted flour," or the "bran bread theory;" the theory that "contact always produces decay," "hot and cold drinks," "the ice-water of the Americans," "climatic influences," "want of cleanliness," "inter-marriage and the mixing of types," &c., &c. The fallacy of regarding any of these as a sufficient answer to the inquiry was shown, and they were considered as of secondary importance, and not as primary causes. Neither, individually or all together, gives the cause.

The relation of civilization was discussed, a term which, in the minds of most of those who use it, has a very vague and incomprehensible connection with the subject. "What is civilization?" and what has civilization to do with decaying teeth?

Civilization is the benefactor of mankind; the chiefest blessings of the human race are the result of its civilization.

Civilization is not responsible for the physical or other evils which follow in her path—not responsible for the decay of teeth.

The evils come from the neglect of, or the abuse of, the agencies, the resources, or the products of civilization.

The most alarming evil of civilization at the present times, from a hygienic view, is the increase of nervous diseases; and coincident with this, and co-related to it—each influencing, and, in a measure, causing the other—is the increasing deterioration of the teeth. Every excessive nerve strain impairs nutrition, and with lack of nutrition the teeth become degenerate.

THE PREDISPOSING CAUSES OF CARIES.

By J. R. MUMMERY, L.D.S.Eng.

Mr. MUMMERY showed that the infrequency of dental caries, or of contracted jaws, was related to the use of metals. In the stone age caries and irregularity of teeth were unknown, but as iron and other metal instruments were indicative of increase of knowledge and art, so did those diseases become apparent and increase in frequency. He also compared the teeth of those who lived in mountainous and in marshy districts, and found the diseases more prevalent in the latter. He also alluded to the effects of water with carbonic acid and other gases in solution, and to the teeth of sailors and agricultural labourers.

[*MONDAY, August 8th.*]

A GENERALIZED TREATMENT OF IRREGULARITIES.

By W. H. Coffin, F.C.S.

(This paper will appear in full in our next issue.—Ed.)

CAUSES OF IRREGULARITIES OF POSITION OF THE TEETH.

By Thomas Brian Gunning, M.D., New York.

The size and the shape of the jaws may cause irregularities of position of the teeth; disease sometimes, when, except for it, all would be normal.

Premature loss of temporary teeth, more than undue retention of them, causes irregularity of position of the permanent teeth.

Disease of one or more temporary or permanent teeth, or the loss of either, may deform the lower jaw and also displace it, and thus cause irregularities of position in the adult set of teeth.

Mistaken views in respect to the treatment of teeth frequently lead to irregularities of their position, sometimes to their loss or injury, and even to serious deformity.

Brief remarks were submitted in support of these propositions, and the means used, and those best adapted to counteract and to remedy irregularities of position of the teeth were pointed out.

THE ORIGIN AND TREATMENT OF CERTAIN IRREGULARITIES OF THE TEETH.

By Oakley Coles, L.D.S.Eng.

The author referred to his classification of deformities of the upper jaw, to be found in the recently-published third edition of his work on that subject, and then stated that at birth all upper jaws, in which there were no lesions, were normal in form, and there was no evidence of what the ultimate outline of the dental arch will be. He then entered upon a consideration of the influence of the antrum in regard to certain irregularities of the teeth, and was of opinion that an irregular growth of the external wall of the antrum was a cause of hypognathism, and associated with struma. Mr. Coles alluded to the relation between the facial angle and the antrum, as mentioned by Professor Humphrey; also to the relationship between the sphenoid, premaxillary bones, and antrum, in reference to dental and maxillary irregularity of form and arrangement. The author then briefly considered certain points in the method of treatment, and recommended the expansion of the whole maxillary arch, and not of the teeth only.

ILLUSTRATING SKETCHES TO CARABELLI'S "MORDEX PRORSUS," AND ITS RELATION TO "PROGNATHIA ETHNOLOGICA," AND MEYER'S "CRANIA PROGENÆA (?)"

By Dr. ISZLAI JOZSEF, Budapest.

Exact determinations of objects and their nomenclature is important in every profession which claims to be regarded as scientific. Dentistry has this— principally in the last three or four decennies—in most respects pursued and attained. Yet, relative to the different kinds of closure of front teeth, such exactness seems to fail.

It was attempted to prove this by a critical survey of Carabelli's statements on this subject, as well as of the relative opinions of other authors.

The author gave his own views on the subject, illustrated with a few anatomical specimens and instruments

EROSION, OR DECAY BY DENUDATION.

By ALFRED COLEMAN, F.R.C.S., &c.

MR. Coleman had seen more of this disease in the female than in the male, but perhaps that was due to more female patients having been seen. All the teeth so affected which he had examined were of a more or less horny-like nature, and he considered the cause as mechanical. The paper was illustrated by microscopic preparations, diagrams, and casts from several animals.

Mr. C. S. TOMES said that the opinion largely entertained on the Continent was that the disease was due to caries, but, the softened tissue being worn away, the appearance was different from caries. He thought that friction was the chief factor in its production, and was of opinion that it was more marked on that side of the mouth which was subjected to the greatest amount of brushing.

Mr. GADDES related the circumstances of a case recently under his care in which the grooves were most marked in the teeth of the upper and lower jaws on the right side. The patient was right-handed, but on the left side, where the friction from the tooth-brush would be supposed to be greatest, there was little or no manifestation of erosion. The patient, a surgeon, also thought he applied less friction to the right side. The cavities in this case were very sensitive.

Dr. TAFT (Cincinnati) said there were several phases and varieties of the disease. In deep cavities in certain situations friction of the tongue or the brush could not cause the condition, because they could not reach the places. He had seen cases in which the grooves were deep, and had sharp edges as though cut out with a cutting instrument; the edges were not rounded borders as a brush would form them. He suggested treating the margin of the gum.

[*TUESDAY, August 9th.*]

ANTRAL ABSCESS.

By Dr. TAFT, Cincinnati.

Having given a description of the anatomy of the antrum, he said the disease to which it was most frequently liable was engorgement, as by serous or mucous fluids. This condition is indicated by a sense of increased weight; then, as the cavity becomes filled, there is a sense of fulness and pressure, with distention of the walls. When the affection is dependant upon local causes, the treatment is likewise local. If the natural opening into the nose is closed, and does not yield to applications to the nasal mucous membrane, an instrument should be passed along the middle meatus, and the opening into the antrum dilated. An opening may, on the other hand, be made through the canine fossa, or through the socket of the root of a molar tooth. Mild, stimulating and antiseptic lotions can be injected through the opening, but over-treatment must be avoided. He then considered supuration of the antrum, and the effects of disease upon contiguous parts; and, in conclusion, referred to the liability to treat those secondary affections for primary causes.

Mr. C. S. TOMES said it was almost unnecessary to use a syringe in cases where there was an opening into the antrum. The patient can, with a small amount of education, fill the mouth with fluid, and force it into the antrum.

Dr. DENTZ (Utrecht) read a short paper suggesting that the term "caries" be abandoned as inappropriate, on the ground that caries of bone was in every respect different from dental caries.

Mr. HUNT (Yeovil) showed the results of some of his recent experiments with electro-types in obtaining medals and reverses for working celluloid, &c.

CONTOUR RESTORATION OF THE SUPERIOR INCISORS.

By Dr. PARMLY BROWN.

The PRESIDENT brought the business of the section to a close and said:—

GENTLEMEN,—Our Congress, so far as concerns Section XII., now ends, and with it our pleasant and profitable interchange of thought. We shall doubtless be asked on all sides what is the outcome of this great and busy gathering, and what shall be our answer? That, for the moment, we have none, or one of little significance or distinctness. We have seen and have come to know men for whom we may long have entertained a very high regard and esteem, or towards whom we may have cherished a certain amount of groundless prejudice, and in either case have had the opportunity of forming a sounder judgment.

And in other ways we have profited much, as must needs be the case, when we encounter mental idiosyncracies, disposing, on the one side, to speculative theories and deductions from biological experiment; and on the other to a degree of patience and manipulative skill hitherto undreamt of. But time will be required accurately to estimate the benefits to science, to our art, and to ourselves, which may be traceable to this great gathering of the original and active minds which shed lustre on our profession throughout the civilized world.

On the occasion of the opening of our section I spoke of one great use of congresses as affording an opportunity and a stimulus to intellectual effort; and this has been, I think all will admit, fully justified by the work of the week. How many of the admirable papers to which your attention has been directed might have been lying by for a more convenient season, but for this great and august occasion? That we are unable to point to any very decided expression of opinion on certain subjects which have long been regarded as *sub judice*, and that many vexed questions have received no satisfactory solution may be plausibly alleged; but it is certain that the attainment of this result must be advanced by such discussions as have taken place within these walls during this short session. As is befitting on the occasion of an International Congress, we have had papers by various hands and from many countries on novel modes of practice, such as replantation of teeth after excision of their necrosed parts, supported by Parisien academic fervour, and tardily admitted by English conservative distrust of the untried, but which will probably now settle into recognised operations within certain limits of age, temperament, and alveolar integrity. We have had exhaustive treatises on alveolar abscess, antral abscess, wasting of the alveoli, erosion, the treatment of irregularity, on anæsthetics, on the reproduction of bone with reference to the maxillæ, on dental surgery in the army, and an eloquent and philosophical discourse on a subject of the first importance—the supposed tendency to degeneracy in the race as shown by the frequency and early occurrence of decay in the teeth. Our session also boasts a thoroughly practical contribution to the art of dental surgery in connection with contour filling, and a distinct step in histology with reference to the nature and origin of caries, which is like a chink in a dark chamber admitting an attenuated beam of light, suggesting a fuller revelation behind. Of these we may, without presumption, now take account, without pretending to determine their ultimate value.

To those who have taken part in this Congress, and who have conduced to this result, no less than to those who will in the future read its history and benefit by what it has achieved, this will, I think, appear no inconsiderable gain.

The discussions have been incisive and animated, without acrimony, and devoid of the misrepresentations by which they are too often unfavourably characterised, and have not seldom risen to a pitch of eloquence which would not have been out of place in the legislative chamber. Gentlemen, the sad hour of parting has come too soon, but the recollection of our too brief intercourse will long remain and linger in our memories as the odours of nature's jewels, the flowers, diffuse themselves with a stronger fragrance with the descending night.

CLINICAL AND MECHANICAL DEMONSTRATIONS.

On Friday, Saturday and Monday, August 5th, 6th and 8th, a number of clinical demonstrations were given at the Dental Hospital, Leicester Square. A great many members of the Congress were present to witness the operations, most of which were very interesting. Among those who operated were—

Dr. Atkinson (New York), who filled an upper canine.

Dr. Davoll (U.S.A.) filled approximal cavities in upper centrals.

Mr. A. Woodhouse (London) filled approximal cavities in first and second lower molars, using tin foil at cervical edge, and cohesive gold on masticating surface.

Dr. Thompson (London) interposed an artificial tooth between second bicuspid and second molar, filling those teeth, and fixing the tooth to the gold plugs. Time of operation about four hours.

Mr. Redman (Brighton) filled approximal cavities in upper bicuspid, using soft gold cylinders at cervical edge, and remainder cohesive.

Professor Watling (Michigan) filled upper central.

Mr. Cooke Parson (Clifton) filled upper central mesial cavities with soft gold.

Mr. W. Brown (Nottingham) filled mesial cavity in second bicuspid, using cohesive gold and hand mallet by assistant.

Operations were also done by—

Dr. Marshall Webb, Lancaster, U.S.A.
Dr. St. George Elliott, London.
Mr. A. W. White, Norwich.
Dr. Blount.
Dr. Rutz, Dr. McKellop, and others.

Mr. Walter Coffin exhibited an engine, actuated by a gramme magneto-electric machine, by Brequet, of Paris, supplied with current from a 4-cell Faurés accumulator, kindly lent by Mr. Bottomley; a modification of Leelanche telegraph battery, in 12 cells with large surface, coupled abreast for cautery, or in series for engine or plugger; a series of cauteries and incandescent illuminators.

Dr. St. George Elliott (London) exhibited an improved Power's engine mallet; a new saliva ejector; a new form of Bunsen burner; an improved hand mallet; a vulcanite and corundum disk, &c.

Dr. Bonwell (Philadelphia) showed a dental engine, modified for surgical operations; an electric mallet, and an engine mallet.

Dr. Telschow (Berlin) exhibited a nitrous oxide apparatus; a steam gauge; and a celluloid injector.

Dr. Underwood (St. Louis) showed a Green electric engine.

At the offices of the Dental Manufacturing Company, on Saturday, the 6th inst., some very instructive and interesting clinics and mechanical demonstrations were given. There were considerably over a hundred visitors who took advantage of the opportunity to witness the operations, and the arrangements were in every way successful.

Dr. Parmly Brown (U.S.A.), using the depressed rubber dam and electric and hand mallets, filled an upper incisor with a large cavity extending along approximal and lingual surfaces.

Mr. W. Brown (Nottingham) filled a crown cavity in an upper bicuspid with adhesive foil.

Dr. Thompson (London) filled cavity in upper central, restoring contour on lingual, labial, and distal surfaces.

Dr. Field (Detroit) fixed a Richmond crown to root of first upper bicuspid, using white cement stopping. In the mouth of the same patient

Dr. F. Comer fixed a Bonwill crown with amalgam, and also made a filling.

Dr. Bonwill (Philadelphia) exhibited his improved engine and mallet, and explained his mode of using them.

Dr. McKellop (St. Louis) showed his universal hand piece, his hand mallets, celluloid tools, and other instruments.

Dr. Campbell (New York) exhibited some beautiful specimens of mechanical work, and demonstrated the use of his new vulcanizer.

Dr. Telschow exhibited his new celluloid injecting apparatus, and he will also demonstrate its use during the current week.

There were also some microscopes exhibited.

PONDER LONG AND LATE.

Ponder long and late, my men,
Ponder long and late;
Up and think 'tis science' cause—
Without fear or hate.
Grasp the thoughts the clearer, men,
As if you meant to win;
Never heed the idle talk,
Or falter to begin.

Never heed the toil, my men,
Or ponder that to scan;
Up and think, and show the world,
'Tis *thinking* makes the man.
Jot your thoughts on paper down,
On Dental things amain;
Careless so you serve the cause,
By might of thinking brain.

Thoughts will come to one and all,
In this short life of ours;
Some will come to rub off rust,
Some to test our powers;
Some will come to show the world
What Dentists' heads can do—
Side by side the surgeon's flag—
Life's healing banner too.

Knowledge is our mart, my men,
Knowledge is our mart;
Will you let that glory slip,
And take it not to heart?
Dentists' heads, and Dentists' hands,
Not solely made for fees;
Do not falter, do not shirk,
Life's noblest victories.

Geo. Ward,
July, 1881.

PASS LISTS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following gentlemen, having undergone the necessary examinations, were admitted Licentiates in Dental Surgery of the College at a meeting of the Board of Examiners on the 27th of June, viz.:—

Amoore, John S.
David, Charles D., M.R.C.S.
Ewbank, Francis, M.R.C.S.
Harris, U. A. C., M.R.C.S.
Hern, William.
Matthews, William.
Oakley, Archibald H.
Pidgeon, William J.
Price, Rees.
Rose, Frederick.
Stuck, Thomas J.
Tothill, Walter.
Truman, Charles E., M.R.C.S.
White, Henry F.

Two candidates failed to acquit themselves to the satisfaction of the Board.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

During the July sitttings of the examiners the following gentlemen passed their first professional examination for the Licence in Dental Surgery:—Matthew Finlayson, Alloa; David Monroe, Edinburgh; John James Bailey, Longton; Thomas Mansell, Hanley; John Sedgwick Spain, Dover; Henry Blandy, Chesterfield. Two candidates were referred.

The following gentlemen passed their final examination, and were admitted Licentiates in Dental Surgery:—John James Bailey, Longton; Thomas Mansell, Hanley; John Sedgwick Spain, Dover; Robert Peel Thomson, Dublin.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

To the Editor of the DENTAL RECORD.

SIR,—In my letter published in your issue of the 1st July, I have made a statement which, it appears, is premature. No official announcement has been made of a vacancy in the staff of the Dental Hospital of London, and, therefore, no appointment could be made. That a resignation is expected, and that the vacancy will most probably be filled by a gentlemen possessing the double qualification, is, at present, merely a rumour; I therefore take the liberty of withdrawing the paragraph referring to the London Dental, and substitute an announcement which has been made by the Board of Management of the Northern Hospital to the same effect.

Yours, &c.,
7, Montague Place, W.C. FELIX WEISS.

THE CONGRESS AND THE SPECIALTY.

THE Medical World has been in Congress. Nearly every civilised nation has been directly or indirectly represented in this, the greatest fair of science and intellect. Such an assemblage of illustrious votaries to the Science and Art of Medicine, honoured with the presence of two of the greatest of living princes, as that which met on the third of August, was unprecedented, and the like we shall probably never see again.

The eloquence and philosophy displayed by the President, Sir James Paget, in his inaugural address, were equal to the occasion, and it was a grand exhibition to our foreign and American *confrère* of the "stuff we are made of."

This Congress is one which will be as a red letter in the history of the Dental Profession. On no previous occasion has Dentistry been more fully, or so specially recognised, than it was as Section XII. of the Seventh Session of the International Medical Congress. This is another of the great achievements which our Profession has made during recent times. The number, variety, and substance of the papers read before, and the attendance on the meetings of the Section, are also evidences of the intellectual calibre and importance of the Dental Profession.

By the formation of Section XII. of this Congress has Dentistry been recognised as a specialty. The address on Specialism lately delivered by Mr. Saunders before the Metropolitan Counties Branch of the British Medical Association, will also do much to elevate the professional opinion and status of our calling; and, at the same time, serve to confirm the need for the specialty. Sir James

Paget said "the partial separation of Medicine, first from the other natural sciences, and now into sections of its own, has been due to the increase of knowledge being far greater than the increase of individual mental power." To no branch of medicine can these words apply with greater force than they do to the specialty of Dentistry; while they, as likewise will our works, justify the institution of the Section on Diseases of the Teeth.

The benefits that will acrue to our profession from this Congress are not now to be estimated. That we have profited much there is no doubt whatever. "But," in the words of Mr. Saunders, "time will be required to accurately estimate the benefits to science, to our art, and to ourselves, which may be traceable to this great gathering of the original and active minds which shed lustre on our profession throughout the civilised world."

ANNOTATIONS.

We would draw attention to the proposed series of Clinical and Mechanical demonstrations which is announced in our advertising pages. The very advantageous offer thus made by Drs. Parmly Brown and Campbell ought to be very acceptable to a great many. The suggestion was given at one of the clinics held at the office of the Dental Manufacturing Company, by a Dentist who is by no means a second rate operator, but who still finds that there is something to learn. Those who could not attend themselves, would probably do well to send their assistants, as they would most likely get some valuable information which could be turned to account.

Pressure of matter prevents us from giving any additional notice of the exhibition of Dental instruments and appliances now on view at the International Medical and Sanitary Exhibition, at South Kensington. The exhibition closes on the 13th inst.

Considering the importance and value of an early report of the proceedings of the Dental Section of the Congress, we decided to defer the publication of the Dental Record until the 10th of the month.

"Intercommunications" and other matter we have been obliged to let stand over for our next issue.

GOSSIP.

Dr. Younger, a San Francisco dentist, has recovered 435 dollars from H. M. Franklin and wife for professional work on the teeth of Mrs. Franklin. The particulars of plaintiff's demands were as follows:—½ hour, examination, 8 dollars; 2 hours, preparing and filling right upper lateral incisor, 80 dollars; ¼ hour, treating lower second bicuspid, 3 dollars; ¼ hour, same, 4 dollars; 2½ hours, filling right upper central incisor and treating, 37 dollars 50 cents; 3¼ hours, filling left upper lateral incisor, 49 dollars; 3½ hours, filling right upper canine, 45 dollars; 3 hours, preparing cavities in lateral incisor and canine, 45 dollars; 2¼ hours, treating and preparing cavity right lower bicuspid, 33 dollars; 2 hours 40 minutes, filling right lower second bicuspid, 38 dollars; 3 hours, filling right lower first bicuspid, 45 dollars; 1½ hours, finishing fillings and polishing teeth, 22 dollars 50 cents; 7½ hours lost time, 75 dollars.

The study of anthropology is fascinating and full of interest, and the literature on the subject is rapidly increasing. In a recently published work, Edward B. Taylor, F.R.S., considers that "much of the wrong doing of the world comes from want of imagination. If the drunkard could see before him the misery of next year with some of the vividness of the present craving, it would overbalance it. Ofttimes, in the hottest fury of anger, the sword has been sheathed by him across whose mind has flashed the prophetic picture of the women weeping round the blood-stained corpse. The lower races of men are so wanting in foresight to resist passion and temptation, that the moral balance of the tribe easily goes wrong, while they are rough and wantonly cruel: much as children are cruel to animals through not being able to imagine what the creatures feel."

The rarity of malformations of the lower lip gives special interest to any record of such deformity. Mr. Edward Hamilton, F.R.C.S.I., has met with two cases during the past twenty-five years, and gives an account of them in the *Dublin Journal of Medical Science.* In one case the lip was cleft in the median line, and involved about one-third of its depth. The free angles did not present the rounded tubercles so commonly observed in cleft of the upper lip. Other cases of hare-lip had occurred in the family. The second was a case of double hare-lip (upper lip), and on each side of the median line of the lower lip there was present from birth a projecting nipple-shaped papilla.

These papillæ grew from the red border of the lip, and accurately fitted into the lateral fissures of the upper lip. Several cases of hare-lip had also occurred in that family.

The annual returns to the General Medical Council show the following results of Professional Examinations held in the year 1880 for Qualifications granted in the United Kingdom under the Dentists' Act :—

	Cum Curriculo.		Sine Curriculo.		TOTALS.	
	rejected	passed	rejected	passed	rejected	passed
Royal Coll. Surg. Eng.	1	17	0	1	1	18
Royal Coll. Surg. Edin.	0	1	0	4	0	5
Royal Coll. Surg. Ire.	0	0	8	47	8	47
Faculty of Phys. and Surg. Glas.	0	0	11	23	11	23
TOTALS	1	18	19	75	20	93

PROF. STRICKER cannot accept the supposition of a so-called Brownian (molecular) movement in salivary corpuscles. He has found the globules to consist of a complete, distinctly visible network. The granules, which have been seen under low powers of the microscope, appear on close inspection and carefully focussing to be thickened points of intersection of the threads forming the reticulum. There is a permanent fluctuation of the threads during the life of the corpuscle. By the action of concentrated salt-solutions the fluctuation ceases gradually and the reticular arrangement disappears.

MR. J. N. LANGLY, in a paper read before the Royal Society, states that all living pepsin gland cells contain granules, and these diminish during digestion. The granules consist of zymogen. The cell protoplasm elaborates or stores up zymogen, and at the moment of secretion the zymogen is converted into ferment or pepsine, and probably other organic substances. During the process of digestion cell protoplasm is being formed; this is being converted into granular zymogen, and the zymogen into secretory products.

MR. A. H. SWINTON has recently discovered that the multiplication and migration of the rocky mountain locust (*caloptenus spretus*) has hitherto been in exact agreement with the minimæ of Wolf's sun-spot cycles.

Dr. C. Meineret states that the proportion of nitrogen excreted without assimilation is, in meat and eggs 2·6 per cent; in milk, 7; in maccaroni, 17·1; in peas, 27·8; in lentils, 40·2; in white bread, 19·9; and in brown bread, 42·3 per cent. There appears to be a much larger proportion of nutriment utilised in the case of animal than of vegetable food.

The New York Board of Fire Underwriters has recently passed a resolution that all buildings in which the electric light is used, or over or through which wires for lighting by electricity may pass, shall be rated as specially hazardous, unless the wires are properly insulated and approved by the inspectors of the board.

Mr. W. Storer Bennett, L.R.C.P., M.R.C.S., L.D.S.Eng., has been appointed Assistant Dental Surgeon to Middlesex Hospital, and Mr. J. H. Whatford, L.D.S.Eng., Dental Surgeon to All Saints' Convalesent Hospital, and also to the Provident Dispensary, Eastbourne.

The annual trial of the Pyx took place on the 13th ult. During the past year there were made 7,348 assays of gold and 6,754 of silver. There has not been any gold coined since the trial of last year, but the coinage of silver for the year amounted to £665,676.

M. Flammarion, in a paper recently read before the Academy of Sciences (Paris), inclines to the view that comets' tails are not material, but perhaps an excitation, electric or other, of æther. Their transparence favours this opinion.

Prof. Huxley, in a paper on the Classification of Mammalia, read before the Geological Society, states that there is nothing in the dentition of either primates, carnivores, or ungulates, which is not foreshadowed in the insectivores.

Mr. Joseph Holland, L.D.S.Edin., has been appointed Dental Surgeon to the St. John and Elizabeth Hospital, Great Ormond Street, vice Mr. C. J. Fox, M.RC.S., &c., resigned.

DR. VON VIRCHOW will attain his 61st birthday on the 13th of October, when it is proposed to celebrate the twenty-fifth anniversary of his Professorship at the University of Berlin.

MR. O. SEYDEL has obtained a patent—5284, 1880—for supplying pure air to cities, by conveying it in pipes from the sea-shore, and delivering it to houses through suitable taps.

THE Annual Meeting of the British Association will be held in York, from August 31st to September 8th. Sir John Lubbock, Bart., M.P., F.R.S., &c., is President-elect.

SIR JOHN LUBBOCK, though regarding the anthropoid apes as next to man in bodily structure, is of opinion that ants must occupy the second place in intelligence.

THE fifty-fourth meeting of the German Association of Naturalists and Physicians will be held at Salzburg, on the 18th and 24th of September.

MR. J. S. AMOORE, L.D.S.Eng., has been appointed house surgeon to the National Dental Hospital, vice Mr. R. D. Ashby, L.D.S.Eng., resigned.

BOGUS dental diplomas are still to be obtained, not now from Buchanan, but from a certain American, Faculty, for 12 dollars.

THE number of physicians, surgeons, and dentists who failed during the past half year was 36, against 70 in the year 1880.

IT is intended to form a Dental Section of the American Medical Association.

Communications.

Communications received from T. Cooks Parson. Walter Coffin, T. Arnold Rogers, James Hardie, A. E. Harris, T. F. Ken Underwood, J. S. Crapper, Joseph Bell (Edinburgh), A. B. Verrier, George Ward, Gilbert Walker, Felix Weiss, James Taylor.

Books, &c., Received.

"Journal of British Dental Association." "Calendar of Edinburgh Denta Hospital and School." "Manual of Dental Surgery and Pathology," by Alfred Coleman, F.R.C.S. "Bristol Mercury." "Croydon Guardian," &c.

THE

DENTAL RECORD.

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A REPLY.

BY THOMAS FLETCHER, F.C.S.

IN the issue for August 10th is a paper by Mr. Laws, in which a reference is made to me, which is certainly unjust.

In making comparative tests in the mouth, he states that my porcelain cement in eighteen months failed to save a tooth from further decay, and did not stand the wear of mastication. In making this material I am aware it does not keep its properties for more than about four to five months. It must be used within this time, or the paste must be replaced by fresh. The tests by which deterioration may be detected are clear enough in my instructions, if users would only read them; and as a further safeguard, the date of making is put on the bottom of each paste bottle. If mixed and used according to instructions, it certainly will stand any wear from mastication; in fact, it cannot be drilled out of a cavity, and, if inserted with anything like reasonable care, most certainly decay never occurs in the cavity, even if the filling is dissolved away to a considerable extent. For his failure, Mr. Laws may fairly blame his own neglect of instructions.

How he uses an ordinary amalgam I do not know; but if he uses either Robertson's or any other, knowing he can use it in such a manner as to make moisture-tight plugs, the recurrence of decay in eighteen months is simply an impossibility, and is not at all likely in eighteen years. The proof is, that the decay continued in only one spot. If Mr. Laws would rigidly follow instructions, without revising them according to his own judgment or ideas, his failures would cease. If no instructions were given, he should ask for them, and follow them precisely; but, if he follows his own ideas, he must blame himself for failures, and not the material he uses.

He says, I have marred my fame with premature statements. Where I have made any statements they have been either the exact words of those operators who have tested and reported on samples, or the positive results obtained by myself. When any point has been doubtful, or time has not been sufficient to prove, the theoretical tests only have been given as a guide to operators.

The simple fact is, that until I commenced testing plastic fillings, and specifying precise methods of using to get certain results, no maker ever attempted to give specific instructions and tests. Everything was left to the judgment (or the want of it) of each operator, and the evil of this exists until to-day. Not one half of the Dentists at the present time will read instructions carefully, and not one in a dozen will follow them without adding or subtracting in some way, according to their own judgment, and without a precise knowledge of the result obtained by their alterations. At one time I was, perhaps, the 'best abused' man in America; and yet my bitterest enemies have, after precise and careful experiment, simply turned round and followed in my steps.

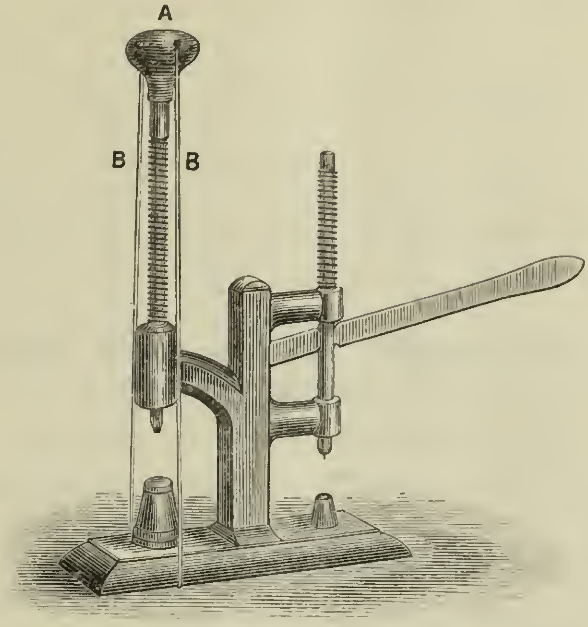
If Mr. Laws, or any other operator, will study and master the use of plastic fillings, knowing precisely what they do, and why they do it, their failures will cease. No one filling known will do everything required in every case; and therefore it is necessary, if an operator is to be successful, that he shall have a precise knowledge of the use and peculiarities of different materials. He must discontinue his guessing, and rule of thumb, and must do nothing unless he knows, without question, the reason why he does it.

As an example of how little a thing will mar a good result, I know one operator who, according to his own lights, followed instructions precisely; yet he failed totally with any and every amalgam, never made a filling to last twelve months, and did not know why. As a matter of curiosity, I watched him insert an amalgam filling. He worked splendidly until he came to the last finish, when, to get a nice surface, he rubbed it well with a corner of a smooth napkin wrapped round a burnisher. As the plug was not hard, he simply shook it well and made it quite loose, so loose that I could feel the shake with a probe. When this was explained, he had made his last failure. He added, according to his own judgment, a detail not contemplated by the maker of the amalgam, and destroyed in a few seconds all the good effect of his previous careful work.

BACKING TEETH.

By J. J. Musgrave, L.D.S.Glas.

Knowing from personal experience how very unsatisfactory are some of the methods in use for rivetting metal backs on teeth previous to soldering, it has occurred to me that it might be interesting to some of the profession if the "Patent Punch and Rivetter," invented by Mr. A. E. Harris, of London, was brought before their notice.



This machine, of which the above is an illustration, has a punch at one end and a rivetter at the other. The tooth is rivetted on an india-rubber pad, and is able to withstand a great amount of force without the danger of breakage, which is imminent when rivetting on wood or lead. The advantages obtained by using this machine are, that a back can be securely put on a tooth with such neatness as the work demands, and, at the same time, securing a vast degree of strength. Many dentists just turn the pins over and file them somewhat flat: others cut their pins short and rivet, while some put a slight countersink in the backing and rivet. Now, common sense will show that however exact the manipulator may be, he cannot hit the platinum pin directly in the centre, but he hits it somewhere, making a scale or head, and the solder makes it secure. At the same time, it does not follow that the back is pulled close to the tooth, so that in a case of a close and sharp bite the rivet, which projects, becomes worn down, and the tooth comes off. However much they may countersink it the rivet will not fill the hole, but merely cover it up.

By using the patent punch, a hole can be made in the back perfectly true, because the punch comes down direct on its work, which is not the case with the ordinary perforators in use, as they touch the plate at the back part of the punch first, and the consequence is that the hole is oblong. The patent punch coming down direct always remains perfect, and keeps a perfectly round hole. This hole is then countersunk with a graduated countersink, that always makes one given-sized hole, which is in shape an inverted cone. The pin is then cut and left only a shade above the backing, the rivetter is brought into position, and the platinum pin can be hit every time directly in the centre, so that there can be formed, as it were, a hollow or partial tube in the pin itself, and the hole be entirely filled up. Should it be necessary to clear away for the bite, the plate can be reduced, as the rivet is part of the backing itself, making it an impossibility for the tooth to come off by any means. The work can be finished without any projection beyond the plate, and even if the solder should not catch the rivet, it will, likewise, be perfectly secure.

PARALYSIS OF SENSORY NERVES FROM EXTRACTION OF A WISDOM TOOTH.

By Frederick Rose, L.D.S.Eng.

Mr. M——, æt. about forty, applied to me on Saturday, July 30th, for relief from extreme pain, which he designated as neuralgia on the left side of face. Without much difficulty, I was able to localise the cause to a badly-decayed lower wisdom tooth on that side, which had had the nerve capped a few days previously, and the tooth filled with gutta-percha, by another dentist, who was not at home when the gentleman called on him before coming to me. There was an accession of pain on percussion. So I at once removed the offending member. The fangs were not at all unusually long, nor was the tooth very difficult of extraction; but when the patient leaned forward to wash his mouth out, he turned to me, making grimaces the while, and asked, "Is this any matter?" "This" turned out to be a complete paralysis of sensation of the filaments of distribution of the mental nerve. By probing the chin and lower lip with a blunt instrument, I was able to completely localise where these filaments were distributed. As soon as I passed the symphysis sensation was evinced, but there was perfect power of movement in the part. I explained the cause to my patient, and reassured him, and desired him to call in three days if he did not recover the sensation of the part. As he has not been to me since, I conclude that the paralysis has only been temporary, caused by pressure on the inferior dental nerve. I may add, that the only other case of the kind that has occurred to me happened at the National Dental Hospital, London, about three months ago. In this case the patient, also a man, æt. about twenty-five, was affected by a peculiar shivering and twitching of side of face, from whence I had removed a lower wisdom tooth. Sensation was perfect, and the shivering passed off in a few minutes. Both roots were grooved by the nerve, and they were exceedingly long. These two cases naturally suggest to one's mind the question, "Why in one case was the sensory nerve affected, and in the other the motor?"

REPLANTATION.

Read before Section XII. of the International Medical Congress. August 4th, 1881.

By W. Finley Thompson, M.D., D.D.S.

Mr. President and Gentlemen,—

The subject of Replanting Teeth, although frequently brought before the dental and medical professions, does not seem to have been thoroughly investigated by either body, yet it is one in which, of late, so many instances of treatment, successful or otherwise, have been recorded, that its discussion is not only permissible, but even necessary; and, as the disquisitions of this Congress will undoubtedly bring it into more prominent favour, or tend to cast it into oblivion, I submit the following questions, hoping that they may bring out a full expression concerning it:—

I. Shall the system of Replanting Teeth, under any circumstances, be a recognised operation in Dentistry? and, if so, under what pathological conditions should this means be employed?

II. What advantages, in contradistinction to the disadvantages, may be claimed for Replanting? Also, what percentage of cases are successful?

Before entering upon the practical bearings of the subject, it would be well perhaps to briefly consider the structure of a membrane upon which replantation is wholly dependent for its success. The diagrams before you are not intended to embody all the microscopical features of interest contained in the pericementum, yet they have, with the exception of fig. 1, been carefully made from specimens, and may serve to explain some portions of my paper.

The three illustrations represent as follows:—

Fig. 1. Diagrammatic—is only intended to demonstrate the relationship of the pericementum to its contiguous parts.

At *a*, enamel; *b*, dentine; *c*, pulp; *d*, papillæ of gum; *e*, blood vessels of pericementum; *f*, bone of alveolus. This diagram, I think, clearly shows the dependency of the peridental membrane upon its nutrient structures to perfectly perform, within its bony environment, all the functions for which it is intended.

Passing to fig. 2, we have a representation of a transverse section of the jaw and tooth of a cat. The bone of alveolus is shown at A, the cementum at C, and the pericementum at B, very highly magnified. The protoplasmic bodies, or masses of living matter (which in the diagram were coloured red), are seen to be pretty generally distributed throughout the tissue; the transverse fibres are also seen—and we have endeavoured to represent their connection with the bony structure of the alveolus and with the cementum.

Fig. 3 represents a portion of a longitudinal section of human pericementum, showing at *a*, a small artery, with the muscular fibre cells of its wall, and also at *b*, a vaso-motor nerve fibre accompanying it. The artery breaks up into capillaries, and a small vein is seen running into the bone at *d*. The fibrous tissue is well shown, many of the fibres being somewhat spindle-shaped. Bundles of fine fibres run along with the vessels into the bone. The protoplasmic bodies, as in the preceding figure, are dark and granular.

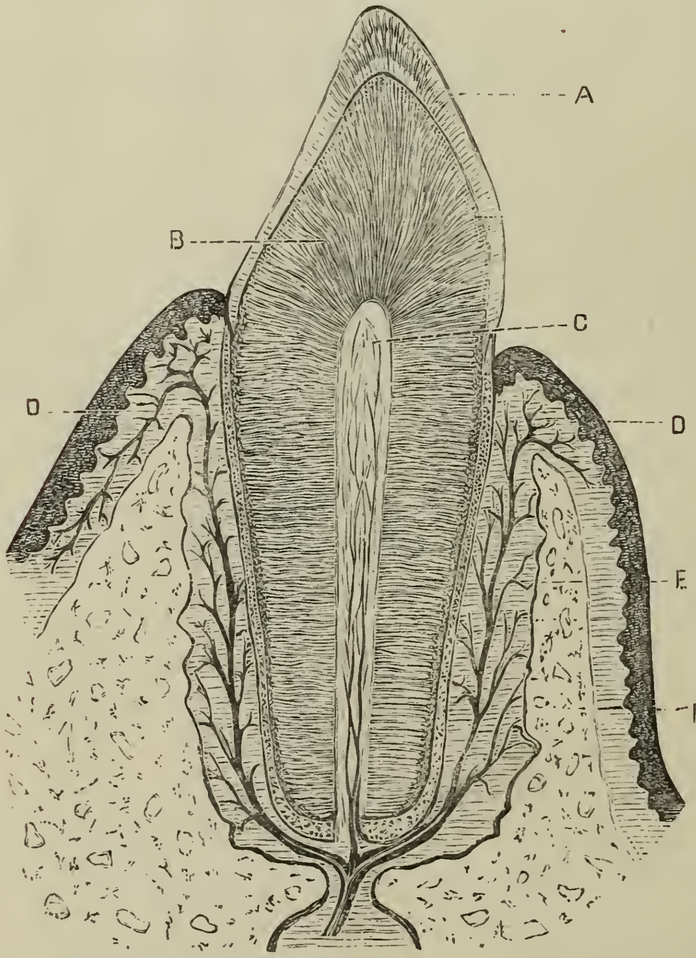


FIG. 1.

The peridental membrane is an organized tissue which must be considered under two aspects—its relation to the vascular alveoli, and to the non-vascular cementum of the teeth. Its office, however, is similar under either aspect, as it acts as a periosteum or nutrient membrane to both, though modified in its action, and even in its texture, to a degree commensurate with the difference existing between the compact cementum and the soft cancellated alveolar tissue. Owing to the intimate relation of the peridental membrane to these two sections, it may—in the absence of pulp irritation—be considered the important factor in lesions connected with the teeth. It is chiefly composed of white fibrous connective tissue, and has a rich nerve and blood supply, while nucleated masses of protoplasm are to be found in every part. The wavy character of the fibres is more pronounced when seen in longitudinal than in transverse section. Their general course is oblique from the bony alveolus to the cementum, without break or interruption. According to Waldeyer, the nerve supply is abundant. The larger blood vessels ramify in a general manner: those from the gum and alveolar surface also anastomose in its substance. The smaller masses of protoplasm are chiefly connective tissue corpuscles, while those near the bone and cementum form the osteoblasts. It is to the vitality and function of these histological elements in particular that we must have the greatest regard in considering, or treating, any pathological condition of the dental periosteum.

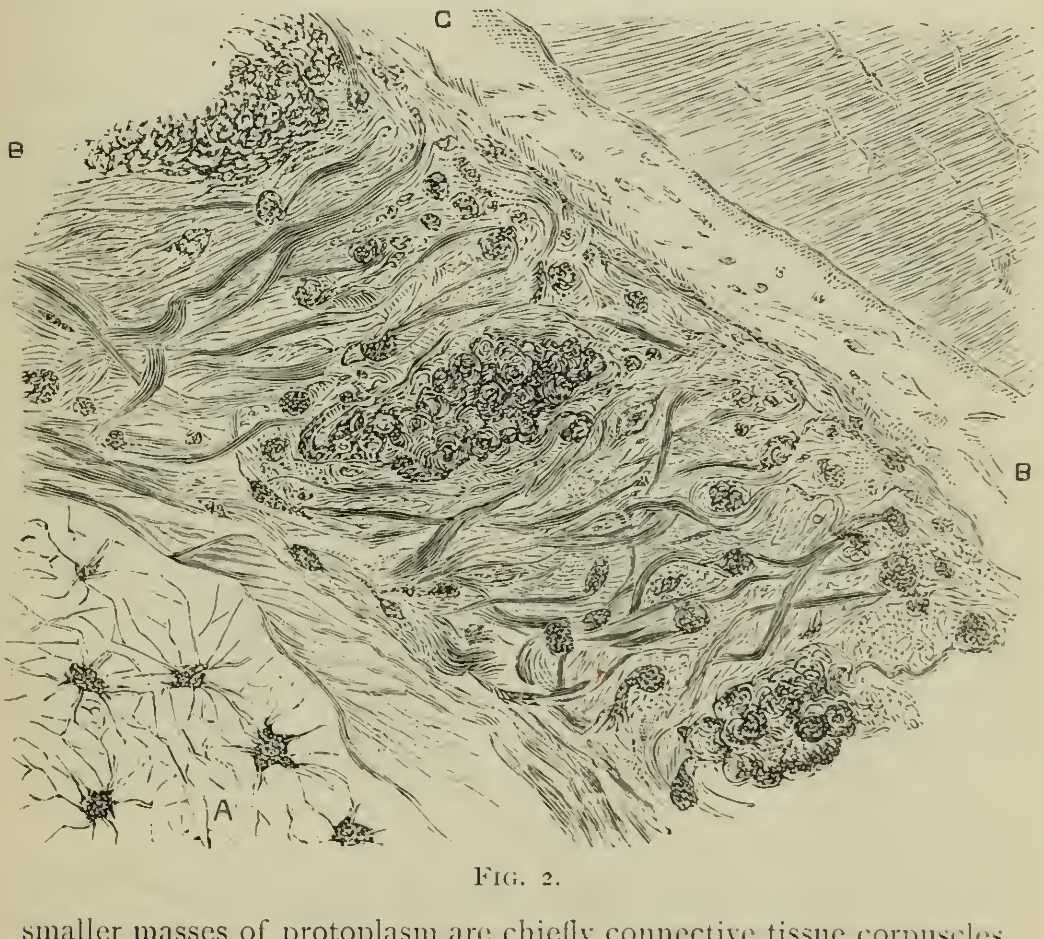


FIG. 2.

Reverting to the first question, "Shall the system of replanting teeth, under any circumstances, be a recognised operation in dentistry?" the recorded instances of success in replanting have perhaps been looked upon as evidences of a certain power in nature not practically available, and consequently classed with other curious anomalies in the transposition of tissues. Want of success, through operating under incompatible conditions, has discouraged some from following to its conclusion a method which certainly has, in some instances, been practised advantageously. These remarks must not be misunderstood; for I contend that the system of replanting should not be introduced in practice, save in severe and otherwise hopeless cases, and it is to these alone reference is now made.

In regard to the physiological action in the reunion of the tooth with the alveolus, we can only reason from analogy. The evidences, however, of the existence of a perfect reticulum of connective tissue with fibres and protoplasmic cells are abundantly proved. In fact, the osteoblasts accumulate in such numbers on the surface of the cementum, that, in certain inflammatory disorders, they act antagonistically, removing part of the cement, producing characteristic striæ and depressions. The office of protoplasm in the reparation of dissevered tissues is so well known that I need only call attention to the existence of this germinal matter in the pericementum, to at once establish a *primâ facie* evidence of the probability of the reunion of a tooth with its socket, through the intervention of the alveolo-peridental membrane. As we see, by an examination of the pericementum, there are, in the healthy condition of the tooth, immense numbers of masses of living matter in connection with the various parts entering into its composition. In health, these germs

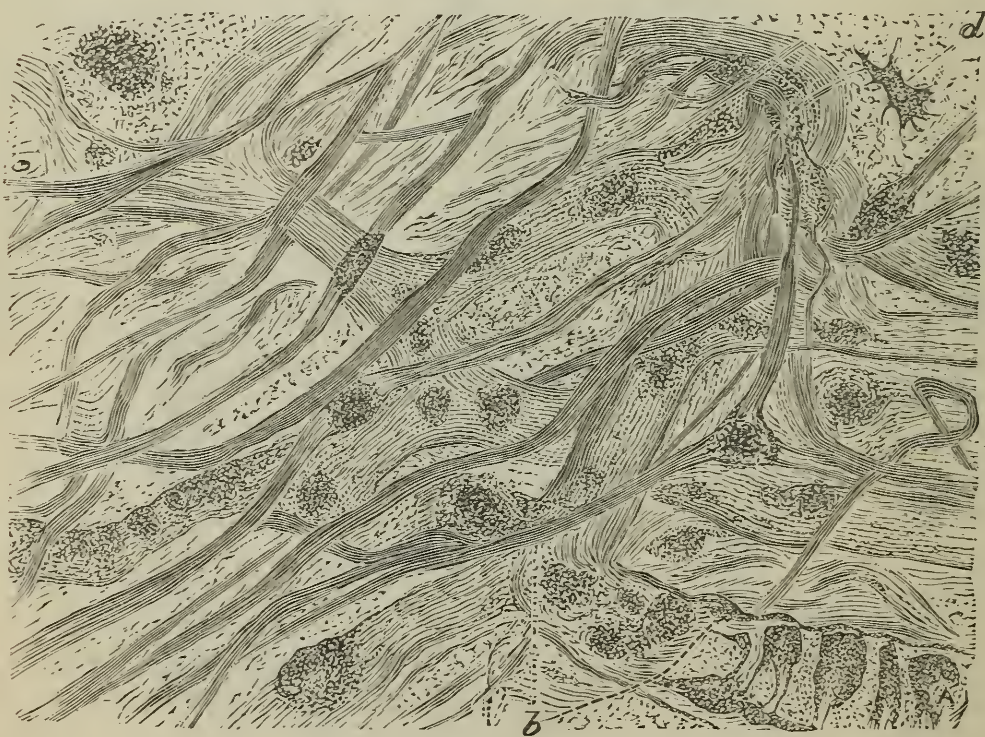


FIG. 3.

go through their proper changes and perform their proper functions. In diseased conditions, or in any departure from the healthy state, these protoplasmic bodies are also the principal agents; and, in such departures from the healthy state, they are excited to action by excessive supply of pabulum, which causes each individual mass of living matter to live faster than it should, *i.e.*, it takes up more pabulum and converts this into more living matter like itself than it does in the normal condition; it becomes enlarged, it divides and subdivides, and multiplies to such a degree that, in the place of the healthy tissue, we have a pus formation. The protoplasmic bodies in the blood—or white blood corpuscles — also actively assist in the inflammatory process.

In recorded cases, it is stated that teeth have been successfully replanted without pericementum upon them. The means of union in such cases I shall not now discuss; but, at the end of my paper, this subject will be indirectly included in a question I shall then put to the meeting; yet it may not be without interest if I cite a case which lately came under my care, where the return of the tooth to its socket was, from various causes, delayed for twenty-five hours. In this interval, instead of being kept in a solution of salt and water, it was encased in bibulous paper moistened with carbolized water. The tooth, after being returned to its socket, appeared for a time to progress favourably; but was, notwithstanding, ultimately lost. It is a question whether this destruction of vital power was not in consequence of too long an interval between extraction and replanting, or whether the carbolized water destroyed the protoplasmic germs which were to, in part, restore vascular circulation between the alveolus and the pericementum. I infer that, in the necrosed condition of the periosteum, which was not tolerated by the plastic effusion from the alveolus, sloughing resulted, rather than any fibrous connection with the cementum.

There is, even in successful cases, great difference in the stability of replanted teeth. In some, considerable mobility exists, indicating a lax fibrous attachment; this sometimes occurs in undrained teeth, caused, no doubt, by the suppression of septic matter, or effusion of inflammatory products into the connective tissue. In others the fixed condition of the tooth suggests anchylosis. These cases are usually found where drainage has been provided for, thus permitting egress of the morbid accumulations from suppuration, as well as sequelæ of organizing inflammation.

The peridental membrane is affected by the same diseases as periosteum in general, and its diseases are usually expressed in the terms of inflammation. This inflammation may arise from traumatic or idiopathic causes; in many cases from diseased pulp, or in the periosteum of stumps which, from their partaking so much of the character of sequestra, are always subject to expulsive efforts. The character, progress and duration of periodontitis will influence its treatment. In the incipient acute stages, palliative measures and anti-phlogistic remedies will sometimes arrest the morbid action of the blood upon the alveolar dental tissues; but, in chronic periodontitis, any means employed must be with a view to the removal of all depositions of a hyperplastic or purulent nature. The acute stage may terminate by resolution, in which case the uneasiness of the tooth soon passes away; or it may become suppurative, leading to alveolar abscess, or, if chronic, to a purulent disintegration of the pericementum. Then we have to consider inflammation as connected with reorganization, on which the success of replantation, theoretically at least, depends.

Whether the inflammation be acute or chronic, the practice of replantation demands parallel procedure—viz., the removal of all the disintegrated periosteum, the destruction of the sac at the apex of the root, and the careful polishing of the cementum where the osteoblasts, from inflammatory influence, have reversed their function and begun to re-absorb the osseous structure of which they were originally formative. This process may vary in its intensity from merely causing miscroscopic pits in and prominences on the cementum to the dissolution of that tissue, and ultimate wasting of the root of the tooth. It was this condition which suggested to me a possible advantage of capping. Of the subject of capping, I shall shortly treat.

II. What advantages, in contradistinction to the disadvantages, may be claimed for Replanting? Also, what percentage of cases are successful?

Those who have treated chronic alveolar abscess must, at times, have experienced the uncertainty of their efforts. Day after day, perhaps for weeks, and even months, have patients been subjected to the inconvenience of almost daily attendance upon their dentists, with but doubtful benefits being conferred, resulting, perhaps, in only temporary retention of the tooth. Shall we not consider this a case open for the adoption of any means promising relief? Then, again, there may be conditions under which the time required cannot be devoted to the case, as often happens when parties come from a distance. If treatment calculated to secure a valuable organ can be performed in a single sitting, shall we not deem it a justifiable procedure?

The operation is one which, from its very nature, must be brought to a quick conclusion. Although, between the intervals of extracting and restoring the tooth again to its socket, several hours may elapse, no unnecessary time should be wasted in its return.

It may be alleged that the severance of the contiguous tissues, and the disruption of the nutrient vessels, is of such a character as to preclude solid reunion of the cementum, the pericementum and the gum and alveolus. That the reunion may partake of the nature of a "seamed scar," and therefore be so far incomplete, I shall not attempt to refute ; but that it is sufficient to continue the low vitality required to ensure the retention of the tooth is now fairly well established by the lapse of years in cases of replanted teeth, which are apparently sound and useful to this day. As an instance—

A patient of the late Mr. Edwin Sercombe, who came under my care for general treatment of the mouth, gave me the history of a second inferior bicuspid replanted some ten years before by that gentleman. The tooth was not discoloured, and it had every appearance of being alive. A slight retrocession of the gum and alveolus had taken place, but not to such an extent as to cause any inconvenience. Numerous other equally successful cases have been recorded.

Perfect restoration of the tooth can also be made where ugly forms of decay extend under the gum to almost inaccessible positions, with a perfection limited only by the skill of the operator, as his ability is not then dependent on the endurance of the patient, whose irritability ceases to be an element in the difficulties of the operation. This advantage, however, should in no way bias a practitioner in the treatment of any case.

The extraction, performed under the influence of nitrous oxide, is of course, painless ; and when the manipulation of the tooth is complete, gas may again be called into requisition in this the only part of the operation from which any further acute pain may arise. Once the tooth is established in position and carefully adjusted in respect to its occluding surfaces, rarely more than tenderness and uneasiness of a few days' duration are experienced.

Having viewed one side of the question, I shall proceed to consider the disadvantages that may be claimed in opposition to it.

We have to combat the antagonism which naturally arises from the mere mention of an operation, the peculiar nature of which is repugnant to the feelings of the patient. From the limited general information, or, perhaps, lack of personal experience in connection with the subject, its results are undoubtedly, at the present time, sceptically received by the profession.

The nutrient structural attachment being ruptured, time will be required to establish reunion of the parts. For several days the tooth must be considered an object of constant care by the patient, who will occasionally be annoyed by its occlusion with the opposing teeth. Although uneasiness may be experienced as an accompaniment to the operation, it is doubtful whether the actual pain is in excess of that caused by local applications.

The next restraining influence in the practice of replanting is the uncertainty and known danger of extraction; this is hemmed in with circumstances quite beyond control. The shape of the alveolus and of the teeth, would, in many instances, enable a favourable prognosis of extraction, yet in some cases it is impossible to accurately predict the result, for the divergence or distortion of the fangs may be so great as to cause fracture of the alveolus or of the root itself, while this same distortion may preclude the return of the organ to its socket.

In considering "What percentage of cases are successful?" I shall first briefly describe the system of treatment which I have adopted. In cases of chronic abscess, and where the apex of the root has lost its periosteum, the denuded portion of the root has been excised, and restored with a gold cap, the object being, if possible, to prevent absorption. To remove inflammatory products, instead of drilling through the alveolus, or cutting a gutter along the roots, a tube has been fixed in the pulp canal, extending from the apex of the root to the grinding surface. From my experience I do not now ascribe much of the success that I have had to the cap; but the tubing, inasmuch as it permits of drainage, I deem important. How far the cap has met the object for which it was intended, I am unable at present to give any reliable information, simply from the fact that, in every case where the tooth has been retained for a period of over fifteen days, I have *never had an opportunity of again seeing it.* That this foreign substance has been tolerated by the living tissues is a well authenticated fact, the physiological effects of which must for a time rest in abeyance.

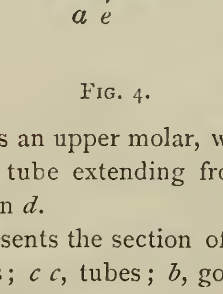


Fig. 4.

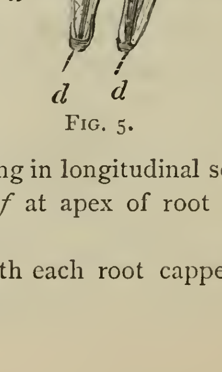


Fig. 5.

Fig. 4 shews an upper molar, with the palatine fang in longitudinal section. At *a* the drainage tube extending from the gold cap *f* at apex of root through gold filling of crown *d*.

Fig. 5 represents the section of a lower molar, with each root capped and tubed; *d d*, gold caps; *c c*, tubes; *b*, gold filling of crown.

I have spoken of the difficulty, in some instances, of returning teeth to their sockets. A case illustrative of this came under my care some two years since, the tooth being a superior first molar, and the palatal fang standing at an angle of about 35°. The tooth having for a long time been affected by chronic abscess, and the lady being non-resident in London, with only a limited time which could be devoted to treatment, I decided to extract, fill and replant it. The tooth was removed at 12 o'clock and returned at 7 p.m. same day. Three-fourths of the crown had been destroyed by decay, and the post-proximate aspect was broken down far below the margin of the gum. This was undoubtedly a case that I should have failed in again restoring to the mouth had it not been for the kindness of Mr. Woodhouse Braine, who rendered me valuable assistance in keeping the patient under the influence of gas while the tooth was both taken out and returned to its socket. I make particular mention of the gas in this case because I was not able to re-establish the tooth in its position until I had used almost the same force in its return that I did in extracting it. The lady called some time since, and, having occasion to take nitrous oxide again, it gave Mr. Braine an opportunity to examine the condition of the tooth. The lady stated that it had done the best of service; and, after the first few days, had occasioned her no discomfort. In this case, the tooth seems fixed—a condition that I am not prepared to say is an advantage.

During a visit of Dr. Wm. N. Morrison, to London, replantation was a subject of considerable discussion between him and myself. I was then endeavouring to investigate the practical benefits (if any) that might be obtained by this method; and my conclusions are drawn from results extending over a period of three years. For the first two years I made it a special point of interest to obtain as many cases as possible. During the last year, however, I have only replanted four teeth. My experiments have been made principally upon people in the lower walks of life. Many cases I have completely lost sight of, so that my failures may not all be recorded.

Number of teeth replanted (estimated)	80
Lost, as far as known	8

The losses were as follows:—

From non-union	5
Imperfect union; three months' retention	1
Abscess recurring	2
Lost cases, as far as known	8

This gives a percentage of success of 90. Of the eight lost, five were not tubed. Of the remaining three tubed, one abscessed again, and the other two were lost from non-union.

Of the number of teeth replanted, I am not able to state the exact proportion tubed, but I estimate it as something over 50 per cent.

During the last twelve months, the number of teeth replanted by me has been :—

In private practice	1
Hospital Patients	3
	4

I now wish my own opinion to be distinctly understood. The cases that I have done were all undertaken for two reasons. First, the teeth were so much diseased that satisfactory treatment in the mouth was exceedingly doubtful; secondly, that I might, from my own experimental experience, be able to record my failures and successes in replantation.

Therefore, the opinion I gave at the early part of this paper I here reiterate, viz., that the system of replanting should only be adopted in severe and otherwise hopeless cases. The percentage of failures, as given by Dr. Magitot and by myself, at once shows that, in treatment of chronic abscess, even replantation is not to be entirely depended upon.

Before closing, I desire to call attention to the subject of transplantation of tissues; and, through the kindness of Mr. C. Macnamara, Surgeon, Westminster Hospital, I am permitted to refer to a case which has been of considerable interest to me. Mr. Macnamara seems to have been influenced in the treatment adopted by what he had seen in connection with teeth replanted. It is (so far as I know) the second instance only in which transplanting of bone has been effected of the same nature and of so extensive a character; and, thinking that it might possess features of interest to this Congress, I have, with the consent of Mr. Macnamara, arranged for as many to see the case as would like to do so. The clinical notes handed to me are as follows :—

"S. W., aged 6, was admitted into the Westminster Hospital, August 10th, 1880, suffering from epiphysis of the upper extremity of the right tibia. The inflammation extended to, and destroyed, the shaft of the bone. Mr. Macnamara consequently, on June 2nd, 1881, removed the dead bone, that is, the entire shaft of the tibia, the upper and lower epiphysis were left in situ, and as much of the periosteum as could be saved. The wound healed, but no new bone formed, so that the child's leg was useless.

"On May 21st, 1881, Mr. Macnamara determined, if possible, to plant small fragments of bone in the situation of the lost tibia, in the hopes that they would produce a new bone. Having a case of amputation of the foot for deformity, the bones of the tarsus were, immediately after its separation from the body, divided into small pieces, and an incision having been made along the front of S. W.'s leg, from the upper to the lower epiphysis, fragments of bone were placed along the situation occupied by the former tibia; the edges of the wound were then brought together. The operation was done under the carbolic spray and antiseptic dressings.

"Two days after the operation, on removing the dressings, there was found to be some tension about the wound, and the sutures were consequently divided and taken away. On the third day, several of the fragments of bone planted in this child's leg were seen to be vascular and attached to surrounding living structures; they have since grown, and are now covered in by granulations. So far as can be ascertained at present, there seems good hope of sufficient osseous tissue remaining and growing in the leg to produce a new tibia."

In sub-periosteal operations, the physiological changes that take place in the membrane to elaborate new bone seem almost incomprehensible. This reproductive power was strikingly evinced in another case, the particulars of which have been kindly furnished to me by Mr. Macnamara.

"A. L. was admitted into Westminster Hospital under my care on the 26th of March, 1879, with acute epiphysis of the upper extremity of the right tibia, and consequent septicæmia, from which the lad remained in a most critical condition for nearly a month. He then got so far well as to enable me either to amputate the limb or to take away the shaft of the tibia without removing the periosteum. I determined on the latter operation, and the section of the shaft of the tibia removed is exhibited in the museum of the International Medical Congress, No. 19. The boy recovered well from the operation; and, from the periosteum I left in his leg, not only has a new tibia grown, but the bone is larger than we know what to do with. The patient has a good knee and ankle joint, and can walk about perfectly well."

These two cases possess many points of interest which bear upon the subject of replantation of teeth. One question, at least, I should wish discussed here is, What points of analogy or of difference are there between the nature of the repair and of bone formation in such instances as those cited by Mr. Macnamara, and the repair and reattachment which takes place between the bone of the alveolus and the cementum of a replanted tooth?

The vivacity of the periosteum, and the reparative action it is shown to be the seat of, together with the pathological and even distinctive functions it is capable of performing, renders a more perfect knowledge of the structure of that tissue, in its several positions and relations, a matter of the greatest importance to prevent error even in such operations as the replantation of teeth.

A GENERALIZED TREATMENT OF IRREGULARITIES.

A Paper Read before Section XII. of the International Medical Congress, August 8, 1881.

By Walter H. Coffin, F.C.S.

The possibilities of regulating are known, but on any case of irregularity presenting for treatment, the practical question will be, What is the best to do, and how is the best to do it? A classification and analysis, in even their infinite variety, of a sufficient number of instances, and the results of their treatment by every possible means, should afford at least an approximate answer to these, and the no less important questions,—what not to do, and how to avoid doing it?

The few models shown have been selected, as fairly representative, from a collection of several thousand, recording the attempted treatment of perhaps a larger proportion than usual of the ordinary irregularities met with in an average practice, and,—as extending over more than twenty-five years—, illustrating the evolution, within certain limits, of an almost generalized method.

A peculiar system thus developed, in use for many years, is no longer a novelty; but having been imperfectly made known, (for which perhaps its advocates are responsible), and a misconception existing as to its real objects,—those in whose hands it has been an invaluable aid, feel that some account of what they conceive to be its capabilities and limitations may not be unwelcome.

Classifying any large series most conveniently by the mechanical exigencies of each case, in certain of them extraction of possibly sound teeth may, of course, be necessary,—though these are less numerous than usually imagined;—a possible alternative in many instances affording, (as shown by casts submitted), satisfactory results.

A large class, uncomplicated by crowding, in which aberrant teeth are easily replaced, admit of direct and immediate correction by suitable means (a simplification of which will be alluded to).

Of the remainder, the majority are cases, of every variety, in which the teeth,—not really too large or numerous for the jaw they might symmetrically occupy,—are by some chance of their eruption, irregularly disposed, interlocked, and crowded. Of these it may be affirmed, quite generally, that rectification necessitates the movement of many teeth or all, and an altered shape or outline of the dental arch; for any attempted direct adjustment of individual teeth will be accompanied by such a disturbance more or less extensive. These present the greatest difficulty in regulating by the usual way, especially with a rigid plate; but in the most intricate or the simplest of them, the permissive control of the general tendency of movement during regulation, reduces their successful treatment to comparative ease and certainty. This mechanical *anticipation* of favourable conditions may be illustrated by assuming an incisor to be moved in a crowded arch by any means applied by a plate rigidly embracing the bicuspids and canines, when a certain force in a certain time may complete the operation; but were the plate either abolished, or its symmetrical halves partly independent and free to move relatively in the plane of the arch, less time and force would suffice; and, furthermore, if its halves tend but slightly to separate by an elastic spring reaction, many cases will require very much less time and force to be exerted on the tooth. The action thus stated in its simplest form is obvious from *à priori* considerations, but was observed, it is believed for the first time, by a singular accident.

Soon after the introduction of vulcanite my father was employing a plate of that material to move an incisor by the swelling of wood. Successive increments of force were resisted until not only was it suddenly in position, but other front teeth were found slightly separated where previously in overlapping contact; the wood, (being nearly on the median line), by lateral expansion, having split the plate down the centre. In this instance, as will often be the case, previous "expansion of the arch" by the means usually applied, was certainly not indicated, and therefore not resorted to, although just the slight amount of spreading required was prevented by the rigid construction of the plate. A conviction of this led to a particular method of treating various irregularities, which, as anticipating changes common to them—usually expansive—, has been called somewhat indefinitely an "expansion treatment;" and the adoption of which has been abundantly justified by experience.

The troublesome and delicate operation of "expanding the arch," as usually performed, if attempted by the ordinary "jack screw" direct, must be accomplished before other regulating action can generally be commenced, and may then prove to be either excessive or unnecessary. The screw is applicable with care to severe contraction, (though inferior to other means); but undivided plates—however thin and elastic—, or hinged plates—however actuated—, have not the freedom of movement and adjustability desirable; and the screw is entirely unsuitable for a split plate.

The little device my father calls an "expansion plate," whether used for direct expansion or not, is intrinsically of extreme simplicity, while of complex regulating action; comprising a means,—easily embodied in any plate—, of conveniently permitting or assisting (instead of hindering or preventing) during regulation, the inevitable changes of the arch naturally accompanying it; and supplementing ordinary expedients with an expansive characteristic. Its distinguishing function depends on the principle of permitting a relative motion, or maintaining a particular controllable reaction, between two semi-independent parts, usually its symmetrical halves.

If required, any force, however small, is sufficient, if exerted continuously over a certain distance, with not too rapidly diminishing intensity. Mere repulsion, however, between two points on a split plate, is an unstable system, and uncontrollable. Allowing a certain freedom of motion, means must be provided for restraining it, and maintaining by a yielding guidance any desired degree of parallelism.

Difficulties attended the first realisation of these conditions; but it is found that a wire spring of certain form, if a constructive part of the plate, will itself meet all requirements.

Modifications of the arrangement found most convenient and satisfactory are exhibited;—after actual use, and in different stages of construction.

The general form may be described as a rather thin vulcanite plate, capping and clasping some or all of the biscupids and molars, and fitting the lingual surfaces of anterior teeth; but divided completely along the median line into two distinct halves, connected, however, by a slight steel wire, so disposed that, while guiding and limiting their relative motion, its tension exerted between them may be perfectly determined and varied in direction and magnitude.

When necessary in such a plate to establish the spring reaction, a surprisingly small, almost imperceptible *stress*, even so distributed, and against a widespread resistance, if continuously maintained and suitably applied, suffices to produce any degree of motion desired.

The perfection of the model must be insisted upon; as an *entire* plate may fit well and securely, and yet both its halves so loose when *divided* as to be useless; while, on the other hand, the halves of a split plate may be easily fitted, which before division could not possibly be inserted. The best impressions have been obtained with the preparations of gutta-percha or ballata gum, no other material affording with ease the absolute fit essential for a split plate. Their physical property, when in good condition, and at the right temperature, of being elastic and recoverable to rapid changes, yielding, if inserted slowly and removed quickly, the most intricate undercuts just sufficiently, and affording by the slight contraction in cooling just enough shrinkage, for a thin hard rubber copy to fit tightly. A delicate and elastic vulcanite plate from a good gutta-percha impression,—if the model be vulcanized upon direct, and not touched to accentuate undercuts or correct imperfections,—will generally spring over the teeth with so absolute a fit, that its removal may even be embarrassing; but until divided its insertion is not usually attempted.

Trials of the metals and their alloys proved the superiority for springs of apparently so undesirable a material as steel.

The almost insuperable difficulty of satisfactorily tempering bent soft steel without deformation of shape, was obviated by the use of pianoforte wire, possessing very uniform texture, temper permitting it to be fashioned and used without heating, and a surface hardness and burnish which greatly tend to its preservation. To coat this wire with other substances was found unnecessary and undesirable. The behaviour of steel to the fluids of the mouth is such that, if hard and bright at first, and continuously immersed in average saliva, it generally assumes a black polished surface, the smooth fairly adherent tarnish being apparently insoluble. A diameter of between three and four-hundredths of an inch, (or about 0·035 inch), is most suitable, as of this a convenient length of from 1 to 2½ inches exerts an appropriate tension in average cases. The force—varying inversely as the length—, may be thus determined within those limits, beyond which a different size is required.

The extremities being buried rigidly in the vulcanite, the uncovered and active portion of the wire, emerging from selected points in the alveolar region, should be entirely on the lingual side of the plate, nicely fitting, but free to move upon its surface. The wire between its attachments may be in a simple curve, when, for localised action (as exclusively posterior expansion), it will urge a relative motion or rotation about some point; but that every kind of motion may be established, there must be one or more reversals of curvature, by either a single couple of opposite curves, or any number of alternately contrary ones, (preferably *odd*), approximately balanced, and as large and symmetrical as possible. Small bends or angles being avoided, the disposition of the wire may otherwise entirely conform to its most convenient adaptation to the particular plate. A serviceable form for an upper general expander is a three or five-curve serpentine figure, like a rounded capital W.

The spring being shaped to fit as nearly as may be the palatal surface of an upper model, or the lingual surface of a lower, has its ends for half an inch (without being softened) slightly flattened and roughened, and so bent towards the model as to raise it uniformly from the surface to a distance of about the desired thickness of the plate, and the portion to be inserted in the rubber tinned or coated with common solder. To several points upon its exposed part, short ends, or loops of binding wire, are twisted to better secure it in the plaster investment. When in shape, it must be free from tension, and attached in the vulcanisation to the plate, which is made *entire*, and afterwards divided.

The plate being modelled in wax, the spring is placed on the surface, with its ends buried within, and when removed by the counterpart, protected from the rubber by tin foil before packing. Finished in the usual manner, entire, the plate is divided with a fine saw, the edges and corners of the cleft being well rounded and smoothed. This, with care, may be done without imparting tension or twist to the spring, which is important.

The plate should be inserted and worn in the mouth without tension for a day or two, to first eliminate causes of irritation not due to its expansive action, and sooner induce toleration of its presence. Any expansive force required may then be established, and its right direction secured, by stretching the two halves with a slight exaggeration into the relative positions towards which it is desired they should tend to move. This, however, may require correction and modification by observing its effects in the mouth. The amount of stress, which is not so conveniently diminished as increased, should be small at first, especially in plates whose expansive function may be simply permissive or auxiliary to other regulating action. It may safely be entrusted to the patient (even quite young) to frequently remove, clean, and replace, after duly cautioning, without fear of disturbing its adjustment.

The experience gained of steel wire has led to its almost exclusive adoption for ordinary regulating purposes, as spring levers acting directly on the teeth, for pulling, pushing, or rotating; and, being permanently fixed to the plate, their convenience, adjustability, and many adaptations, are remarkable. Combined with a split plate they are found to replace with advantage, screws, inclined planes, wedges, levers, and ligatures, in many of their local uses, and, moreover, are practicable where nothing else can be applied. In fact, by the gradual simplification of means, and the elimination of uncertain devices, a delicate split plate, with perhaps one or two short lengths of small wire closely fitting its surface, is often now to those who employ it, the representative of the wondrous combinations of nearly all the known "mechanical powers" that once exercised their ingenuity. Where in simple cases a plate is unnecessary, with an inch or two of steel wire and elastic rubber tube, efficient expedients may frequently be improvised.

When direct expansion of the arch is indicated, the thin, spring reaction plate, fitting closely the palate, teeth, and tissues covering the alveoli, and not filling the mouth or impeding any of its functions, will, with the minimum of trouble and attention, effect any desired degree of that spreading and moulding of the mouth which it is well known may, to a surprising extent, be rapidly and almost painlessly produced. So easily is this done that caution must be observed not to inadvertently exceed the intended results, and the temptation to so readily make room for crowded-out teeth, though often with most gratifying effect, must sometimes be resisted. Indeed, the extreme facility and rapidity of general expansion by the split plate, has, in the hands of some without experience of its limitations and abuses, been to the prejudice of the method.

Among the uses of direct expansion, its interesting application to the operative treatment of caries, and to slightly overlapping incisors, may be discussed together.

In young mouths where interstitial decay of incisors closely in contact almost defies successful treatment, any operation attempted, whether of separating surfaces, shaping or filling cavities, or restoring contours, will, of course, be facilitated by gaining ever so small a space between them. Paradoxical as it may seem, it is actually less painful and troublesome to secure ample spaces between all the front teeth at once, than to wedge two of them apart in the ordinary way, with the advantage of easily maintaining their separation without irritation during any course of treatment.

A plate exerting anterior expansion will rapidly—and usually almost painlessly—separate the incisors, and by a suitable adjustment of the bearing surfaces, may readily be caused to distribute spaces equally between all the front teeth. Their slight tenderness soon disappears if held by the same or another plate, and they may be kept apart without fear of their not coming together again. In nerve inflammation, caution will suggest itself; but an accident has not occurred from that cause. If the incisors are just overlapping, slight expansion, with suitable disposition of the bearing surface afterwards, usually permits the natural action of the lips to straighten them.

In some of these cases it may be necessary to partly maintain the expansion of posterior teeth by a suitable retaining plate, exposing their articulating surfaces till the bite is readjusted by those of the other jaw accommodating themselves. Where expansion in one jaw is considerable, the bite may require a slight mechanical expansion of the other, which, for this purpose, and assisted by the articulation itself, is easily attained.

Expansion, where posterior teeth wrongly articulate, presents little difficulty when the conditions are symmetrical on both sides; when otherwise, or confined to one side only, a differential or even a unilateral effect may be produced, according to the number and kind of teeth the action of the plate may be distributed or concentrated upon, and the arrangement of its articulating surfaces. In differential expansion (which may occur unexpectedly) the relative motions appear disproportional, that is, seem to vary (inversely) *more* than the estimated resistances.

Lastly, the obvious application of the divided spring plate to narrow mis-shaped mouths with high contracted roofs, unfortunately also presents considerable difficulty. These cases admit of very great improvement, (as illustrated by models exhibited), where circumstances are favourable for expansion; as when the bite can be either kept normal or made so, and the jaw is not really so contracted as the dental arch makes it appear; for such the split reaction plate is peculiarly adapted and unsurpassable, if treated with caution.

In several cases accompanied by prominent incisors, after only slight posterior expansion, considerable spontaneous recession of the incisors has occurred, probably by the action of the lips, before any special mechanical means were employed.

In the models of many cases treated will be observed the profound alteration in shape the palate vault appears to have undergone. Inflammatory symptoms observed along the median line, corresponding to anatomical relations, (possibly caused by the edges of the cleft plate), have suggested certain bone disturbances; but though the extensive changes seem otherwise almost inexplicable, inter-osseous action can only be conjectured.

While expansion is most readily performed in young mouths, especially under 16, the only limitations of age would seem to be the diminished power of restoring fixity after movement, which must be inferred of advanced age; though in a case of considerable expansion at 45, the teeth became perfectly firm afterwards.

It is hardly necessary to dwell on the desirability of the greatest possible simplicity of regulating devices, in principle and details; and the self-maintaining adjustability of plates, that they may be as independent as possible of any control by the patient, whose co-operation should be confined to their perfect cleanliness only, and the health and comfort of the mouth. But it may, perhaps, be pointed out, that greater beauty and finish of plates than is customary is not without effect in assuring care and attention to their good condition.

Great credit is due for working out certain details of expansion plates, to Mr. Peter Headridge, of Manchester, for many years assistant to my father. This gentleman even obtained a patent for some constructive particulars, which, however, he very advisedly relinquished. The curious are referred to specification 1101, 1869.

In final justification, the advocates of a method which they find to simplify and trust may extend the treatment of irregularities, appeal to their records of results, which—of whatever real importance or value—would have been difficult or impossible to otherwise attain; and have ventured at such length to detail their procedure, for confirmation or criticism by others.

This paper was illustrated by more than 500 old regulating plates which had been actually used; about 400 being "expansion plates," upper and lower, symmetrically and unsymmetrically divided, of which nearly 200 were "simple expandors," some 200 embodying other regulating devices with "expansion"; the remainder showing the application of pianoforte wire in ordinary plates for general regulating purposes. There were also specimens, with demonstrations, shewing, in different stages, details of their mode of construction. The models exhibited in the Museum of the Congress, at Burlington House, of forty typical cases, shewing by three or more casts to each case, the condition before, during, and after treatment, were classified as illustrating—

1. Expansion auxiliary to ordinary regulating, (*a*) in simple crowding, (*b*) for rotation and alignment.
2. General expansion, (*a*) for operative treatment of caries, (*b*) for mis-articulation, (*c*) *versus* extraction of misplaced teeth, (*d*) for prominent incisors, (*e*) for contracted, narrow, or misshaped arch.
3. Applications of steel wire to every kind of ordinary regulating, (*a*) alone, without plate or accessories, for alignment or rotation, (*b*) combined with elastic ligatures, (*c*) with an ordinary plate for moving, shortening, lengthening, and rotating teeth.
4. Combinations of the above.

In discussion upon the paper,

Dr CUNNINGHAM (Wisbech) confessed to the great assistance he had derived from Dr. Coffin's expansion plates, the contraction and use of which, however, depended so greatly on details, that he attributed his own success largely to the personal instruction and advice of Dr. Coffin. He, therefore, regretted that the paper omitted many important points, as, for instance, the description of the use of gutta-percha, which, though many think they know all about it, he found by Dr. Coffin's peculiar method to revolutionise the taking of impressions. He thought that all who really tried this method of expansion—which deserved wider recognition,—would find, as he had found, many unexpected and useful applications of the split plate.

Dr. ROSENTHAL (Liège) having long employed Dr. Coffin's system with great satisfaction, had been surprised at its simplicity and efficiency, and was gratified at the ease of producing results which he had thought impossible. He described an extreme case, in which the patient, whose speech was at first unintelligible, had ultimately a good speaking and singing voice.

Dr. DENTZ (Utrecht) suggested and hoped that the paper might be printed at once for distribution, before its official and long-delayed publication in the transactions of the Congress.

The AUTHOR, in reply, thanking those who so kindly added valuable testimony of experience most gratifying to him, regretted his inability within the limits of time to satisfactorily treat many technical points merely referred to, or omitted altogether; and he begged those who had honoured him with their presence and attention, to further favour him with enquiries or criticism.

DENTAL SURGERY IN THE ARMY.

Read before Section XII. of the International Medical Congress, August 4th, 1881.

BY THOMAS GADDES, L.D.S.Eng. and Edin.

COGNISANT of the notable fact that the executive of the International Medical Congress has, for the first time, so recognised Dental Surgery as to set apart a special section for that branch of Surgery; likewise, that this Congress is scientific, not only in the common acceptation of the term, but scientific also in the Medico-social sense, it may not be inopportune to solicit the opinion of this section—so weighty and so influential—upon the question of Dental Surgery in the Army.

The regular forces of the British army consist of 191,000 men;
The average number abroad being 103,000;
The average number at home, 88,000.

For this great number of men, who are the units of Her Majesty's power, there is provided a specially trained and examined medical staff. The special subjects of study and examination of the Army Medical Department are Medicine, Surgery, and Hygiene. Therefore, we may infer that the health of the soldier is the immediate consideration of that department.

I need not, before this Dental Section of the International Medical Congress, set forth the relation of the teeth, and the importance of Dental Surgery to the general health. Their association is too well known, not only to the specialist, but also to the observing physician and surgeon. Yet, in the face of these facts, army medical officers have not to receive, neither, as a rule, do they obtain, any special instruction or experience in the treatment of the common, and often very painful, diseases of the teeth.

In 1858 the Royal College of Surgeons of England, recognising the special nature of Dental Surgery, and the inadequacy in this respect of the education for the Fellowship and Membership of the College, instituted a specific dental curriculum, examination and diploma. Furthermore, the Council of this College decided not to accept the signatures of teachers of Dental Surgery unless they possess the License in Dental Surgery,—the Certificate of a Fellow or Member only is not so recognised. The specialty of Dentistry has also been recognised by the Royal Colleges of Surgeons of Edinburgh and in Ireland, and by the Faculty of Glasgow. These bodies, under the powers of the Dentists Act, 1878, have adopted the dental curriculum recommended by the General Medical Council, and now hold examinations and grant degrees in Dental Surgery. By the Parliament of 1878, by the General Medical Council, by the Royal College of Surgeons of England, and the other Surgical Corporations, has the necessity for, and the special nature of, Dental education and examination been sanctioned. Yet Dental Surgery is totally ignored, and enters into no part of the special training required by the Army Medical Department. The result of this is that the non-commissioned officers and men of the British army receive from the Army Medical Service, as a whole, such treatment as must, from the nature of the case, be far inferior to the skill in Medicine, Surgery, and Hygiene, displayed in the highest degree by members of that service. And, where treatment for diseases of the teeth, from which of a certainty nine-tenths who are sufferers, is not given by the army surgeon, relief is not unfrequently sought and obtained at the hospitals of the charitable, maintained for the necessitous poor only. Furthermore, how many teeth are lost which might, in these days of conservative Dental Surgery, be saved? How much suffering before their loss, and also after their loss, is endured by the brave hearted, for the want of the administration in the army of an organised system of Dental Surgery?

That there is a necessity for such an administration all must agree; but the question how such is to be accomplished will require careful consideration.

Several members of the Army Medical Service, wishing to improve their knowledge and skill in dentistry, have attended the special course of instruction at certain of the Dental Schools, and have qualified themselves by taking the Diploma in Dental Surgery. Though these are very exceptional instances, they indicate the feeling of want of knowledge in dental matters, which is truly the general feeling of the Army Medical Service.

In October, 1859, there was presented to the Military Department of the Madras Government, a report on Dental Surgery, by Acting-

Garrison-Surgeon H. W. Porteous. That report showed that the Honourable the Governor in Council had, in May, 1859, under his consideration the fact of the European soldiery being inadequately provided with any dental assistance, beyond extracting teeth when the cause of toothache: That it was resolved—"A medical officer in every European regiment be instructed in Dental Surgery." That "The Commander-in-Chief is requested to issue such subsidiary instructions on the subject as His Excellency may consider necessary for giving it effect."

Dr. Porteous at once made arrangements for carrying out, in H.M.'s 44th Regiment, stationed in Madras, the provisions of the former resolution. Practical instruction was given by him to the Assistant-Surgeons twice a week. For one group of 66 patients, 108 teeth were stopped, and 203 roots extracted. The success of the system pursued was in that instance so far satisfactory that it was only necessary to extract three teeth, "two of these on account of alveolar abscess, and one in which the filling had induced more irritation than the patient was inclined to bear." The report continues—"By the extension of the present system of instruction in Dental Science to Assistant-Surgeons of the army generally, it is hoped that the practice of extracting every aching tooth will be reduced to within the narrowest limits, and that the arrest of decay in teeth soon after its detection will be the means of preserving many of our soldiers' teeth which, under the present system, are sacrificed whenever they begin to be painful and troublesome."

In March, 1857, the Director-General of the Army Medical Department issued a circular to the Medical Officers of the Service. In that circular Director-General Dr. A. Smith instanced the advances made in conservative Dental Surgery, and said, "There is no occasion for me to enlarge on the important influence, advantageous or the reverse, on the functions of digestion and nutrition which the sound or defective condition of the teeth exercises; and I need not dwell on the fact that their conservation is especially of consequence to soldiers, as their absence or defective condition found a very possible cause of impaired digestion and consequent loss of health; and, moreover, occasionally constitute a direct cause of inefficiency and unfitness for military service."

. . . "I am of opinion that a considerable gain to the Service, besides comfort to individuals, would accrue from a more improved practice in Dental Surgery than that which has hitherto obtained in military life."

. . . "I therefore hope that Medical officers of the Service will co-operate with me in endeavouring to introduce into military medical practice the improved modes of treatment now all but universally adopted in civil life."

In reply to the above quoted circular of the Director-General, the Medical Officers pointed out that they had not received any practical instruction in a branch so absolutely requiring it, and that they were not supplied with the requisite instruments.

Notwithstanding the success which attended Dr. Porteous' experiment of two seasons, and the valuable support this excellent movement had in Sir Charles Trevelyan, at that time Governor of Madras, and of the Director-General of the Medical Department, the Government took no action.

In 1865 Surgeon-General Balfour was requested to inquire into and report upon the health of the troops stationed at the extensive barracks at Secunderabad. In an exhaustive letter of December 26th, 1866, he stated that instances occurred of impaired assimilation from imperfect mastication, and a good dentist would preserve the teeth of many soldiers.

Defective teeth is a cause of rejection among recruits, and it may be interesting to mention the number refused from this cause during eight years:—

1871	12·54	per 1,000
1872	8·07	
1873	7·62	
1874	5·86	
1875	6·03	
1876	7·07	
1877	8·93	
1878	9·60	

In passing the recruits the medical officers have to examine the condition of the teeth; and certainly there cannot require any argument to substantiate the statement that such an examination would be better effected if the examiner had the benefit of special dental instruction and experience.

To meet the requirement of a better administration of Dental Surgery in the Army than has hitherto existed, the most feasible means would be to impart to the army medical candidates special instruction. This might be done by a systematic course of lectures and of operative work, to be included in the subjects of study at Netley; and, finally, let the Pass Examination include questions, and, above all, practical work, in Dental Surgery.

CONTINUOUS GUM-WORK.

By A. B. Verrier, L.D.S.I.

Read before the Western Counties Dental Association, July 30th, 1881.

I believe the idea of uniting artificial teeth to a metallic base, by means of a fusible compound, originated with the French. We are especially indebted to Dr. John Allen, a distinguished American dentist, for very important and original improvements in the compounding and manufacturing of the materials employed in continuous gum-work. The body and gum enamels, prepared according to Dr. John Allen's formula, may be obtained at any of the leading dental depôts. Basing my opinion upon results and experience in continuous gum-work, I am led to prefer the material as compounded by Dr. Allen; it being more certain in its results, and, when properly manipulated, is certainly not so liable to fracture when worn in the mouth. I have encountered many difficulties in successfully attempting to work the continuous gum process with the ordinary furnaces in use, principally on account of the great labour involved in their proper management, in consequence of which many have abandoned the process and condemned one of the most beautiful processes in mechanical dentistry. The huge dimensions of former furnaces, the difficulty encountered in their management, the time occupied in firing and cooling the work, besides the annoyance caused by dirt and dust, and the risk of being roasted one's self, precluded their general adoption. I have here two furnaces, made after my patterns, which are intended for use in the continuous gum process, the smaller of the two is designed for use with coal-gas or gasoline; I prefer the latter on account of its freedom from sulphurous and other gases, and consequently diminishing the liability of gassing the work in the process of firing. I would mention that Mr. Thos. Fletcher has kindly consented to make the furnaces for me of his porous fire-clay. The larger furnace is intended to be heated with coke, broken up into small pieces, assisted by atmospheric air and the vapour of petroleum until thorough ignition of the coke has taken place; when the gas may be turned off and the necessary heat maintained by the action of the foot-blower, until the process of firing is complete. The small furnace is intended to stand upon a fire-clay slab, supported by brackets fastened to the wall of the laboratory. The injector which is supported by the fire-clay slab underneath the furnace I have constructed so as to distribute the flame more equally over the whole surface of the muffle, and is made so that it may be raised into direct contact with the inlet at the bottom of the furnace, and so prevent the return of the gas. I am now engaged in completing a self-acting air and gasoline generator which is principally intended for use with the injector furnace, and will reduce the time and labour in working the continuous gum process very considerably.

A denture made in ceramic paste, when artistically put out of hand, and the base-plate scientifically adapted to the oral tissues, is certainly the most beautiful production of dental prosthesis, besides being the purest and sweetest that can be worn in the mouth. The objection urged against continuous gum-work by many dentists is its weight, but I am afraid the failure proceeds from the fact of bad manipulation, imperfect construction, and ill adaptation of the base-plates used in this process. Unless the work is thoroughly and well executed, from the procuring of a perfect model of the dental arch, to the completion of the denture, failure will be inevitable. To retain a denture successfully in contact with the tissues of the oral cavity depends upon the accuracy of its adaptation, and the consequent exclusion of the atmospheric air from between the gums and base-plate. If we could exhaust the air entirely from between the gum and plate so that the full force of the atmosphere be exerted upon its lingual surface, it would adhere with great tenacity, resisting a strain equal to fifteen pounds to each square inch of its surface. I have devoted time and attention to the construction of dental atmospheric plates, with varied success, but for some time past I have relied upon a style of atmospheric plate especially applicable to the continuous gum process, possessing many advantages over the ordinary mode of construction, several of which I may as well mention. Its freedom from any tendency to warp in the process of firing the gum body or enamels; thorough stability in the mouth; great rigidity under the pressure of mastication; perfect adhesion and freedom from any tendency to injure the mucous membrane; its comparative lightness and simplicity of construction. I have with me a specimen plate intended for an upper denture in continuous gum-work, made of two extremely thin soft platinum plates, united at their margins, and having a slight space between the two throughout the whole extent of their surface.

I always procure models of the mouth in plaster of Paris. Before casting the metal dies, a chamber or shield, oval in form, must be moulded on the surface of the plaster model, and should not exceed in diameter half-an-inch, while the thickness should not be more than one-sixteenth. Having decided upon the dimensions of the base-plate, allow an extra width of one-sixteenth of an inch fuller all round, as the edge must be turned up and present an abrupt shoulder to the margin of the gum enamel. The base plate may now be struck up to the required form, and the edge turned up with a suitable pair of pliers and hammer. Being satisfied with the fit of the plate, secure it to the plaster model with adhesive wax. A layer of very thin sheet wax (not thicker than a threepenny-piece) is now to cover the whole lingual surface of the swaged metal plate to within one-eighth of an inch of its entire border, cutting away the wax plate covering the shield level with its surface, leaving it exposed. The edge of the wax plate in position upon the model, should be nicely bevelled off at its outer border to a very thin layer. Mould this in sand, and procure metal dies. A second plate is now to be struck up large enough to cover the surface of the wax plate and shield, allowing width enough for soldering. The two plates are now to be removed from the plaster cast and thoroughly cleaned by boiling in a weak solution of sulphuric acid and water, washing and brushing with pumice powder in the lathe. Before uniting the two plates a few very fine holes must be drilled through the side of the shield struck up in the base or first plate, to prevent the bursting of the compound plate in the process of soldering, and also for the exhaustion of the air from between the plates by the patient, when worn in the mouth. The plates forming the compound plate are now to be united with pieces of fine gold around the margins. The fine gold used in soldering should be laid on freely, as the platina absorbs most of it in the process of firing. If the union of the two plates is perfect, when tried in the mouth adhesion will be so complete as to require a very considerable force to displace it, the more so if the patient be requested to exhaust the air from between the plate by merely closing the mouth and gently sucking it. I do not advise this course, as the adhesion is so complete as to require a very considerable force to remove it, resulting from the pressure of the external atmosphere upon the whole outer area of the plate in consequence of the partial vacuum created between the plates, causing it to adhere with great tenacity. Being perfectly satisfied with the thorough adaptation of the base-plate, proceed to take the articulation in the usual way, by attaching to the ridge of each plate a roll of adhesive wax as near as possible in width to the length of the teeth required for each plate respectively. Place the plates with the wax in position, requesting the patient to throw the head well backwards, so that the lower jaw shall be held back by the tension of the muscles of the neck when the mouth is closed. Antagonize the wax rims and mark the position of the fraenum at the median line ; and then adjust the whole in the articulator. Having selected a suitable set of continuous gum-root teeth, proceed to set them up in the wax rims upon the base plate, beginning with the six front upper and lower teeth. Place in the mouth and arrange them as to length, fullness, and general outline, avoiding artificiality. The whole set of root-teeth may now be set up in the wax rims, allowing their roots to rest upon the plate, and finally tried into the mouth, adjusting any particular tooth or teeth according to your æsthetic taste and requirements of the case; for on this stage of the work depends the success of the denture as to shade, size, length, fullness, outline, and natural appearance when finished. The adhesive wax adherent to the labial surfaces of the teeth must be removed, leaving them well exposed, so that they shall be held securely by the investient during the process of backing.

The labial surfaces and cutting edges of the teeth must now be covered with a very thin coating of fine clean plaster of Paris, and allowed to set firmly. Another layer not less than half-an-inch thick, composed of equal quantities of finely powdered asbestos and plaster of Paris in water, is placed around the outside of the previous covering and the plate. The best way is to turn the batter out upon a slab, previously laying a few folds of blotting paper on it to remove any excess of moisture, and then press the plate with the teeth upwards into the mixture to within half-an-inch of the slab. Then, with a spatula or suitable knife, bring the investient up around and over the previous coating of plaster. The investient should be sufficiently thick to hold the teeth in position during the process of fitting and securing the platina backs; when set, the wax adherent to the teeth and plate can be removed with boiling water. The pins at the back of the teeth are now to be bent out, and a rim of soft platinum, No. 6 gauge, fitted to the backs of the teeth and base-plate, bending down the pins to secure the platinum backing in place, which may be put on in several strips with the ends overlapping each other; turning over the lower edge in positive contact with and upon the base-plate, and should be one continuous band all around when soldered. Pieces of fine gold, moistened with ground borax and water, are to be put upon the parts to be soldered.

The work is now ready for soldering, which I always do in the furnace, as follows:—Heat the small gasoline furnace to a good red heat, and then turn off the air and gasoline supply, gradually introducing the muffle with the piece to be soldered, which may remain in the furnace until perfectly annealed. When the investient is quite dry, draw the muffle forward to the furnace door; now turn the gasoline and air supply full on, at the same time working the foot-blower, and ignite the gas by throwing in a lighted match. Heat up the furnace gradually a second time, introducing the muffle with the work, and apply the heat until the process of soldering is complete. The work must be allowed to cool gradually, before removing the investient. The piece must now be well washed in water, using a stiff brush, and afterwards boiled out in a weak solution of sulphuric acid and water, and then washed in hot water to remove any trace of the acid. Now roughen the plate with a sharp graver.

The piece is now ready to receive the first application of the ceramic paste or gum body. For this purpose I have two shallow earthenware pots, with good fitting covers to contain the gum body and enamel, one or two well-tempered spatulas, a suitable agate burnisher for compressing the compound, also one or two fine camel-hair brushes for laying on the paste, and one, rather stiffer, for removing any grit adherent to the surfaces of the teeth previous to firing. Also three wide-mouthed stoppered bottles containing distilled water for washing the brushes during the process of laying on the gum body and enamel. Before commencing to lay on the ceramic paste, see that everything is perfectly clean, and the floor of the laboratory is well sprinkled with water, to prevent against dust rising and so falling upon the work. A sheet of clean blotting paper should be laid upon the bench or table, on which the work and necessary articles used in the process can be put. Holding the work in the fingers of the left hand, which should be perfectly clean, proceed to lay on the ceramic paste. Mix with distilled water in one of the earthenware pots sufficient gum body for the case in hand, to the consistency of thick cream. With suitable spatula and camel-hair brushes proceed to lay on the paste, working it well into the spaces between, under, and around the teeth, removing any excess of moisture with small pieces of blotting paper, and then thoroughly condensing it with the agate burnisher, covering the surface of the plate to about the thickness of a threepenny-piece. The layer of paste is then carved to represent the gum, palatal arch, and rugæ, taking particular care to keep the necks of the teeth well defined; and, finally, before firing the work, the surfaces of the teeth should be freed from grit or particles of gum body by brushing them with a moderately stiff camel-hair brush. The work is now ready for firing (but before applying the whole volume of heat, the piece should be slowly but thoroughly dried in the furnace) by heating it to a red heat, turning off the gasoline and air supply, and then introducing the muffle containing the work gradually. The work should rest on a piece of platinum wire bent so as to form three supports, and should be placed just inside the mouth of the muffle; when the work is thoroughly dry and annealed, withdraw the muffle from the furnace, allowing it to rest at the furnace door.

The gasoline and air supply is to be turned fully on, at the same time working the foot-blower, and igniting the gas by throwing a lighted match into the furnace, gradually introducing the muffle as the heat is increased, until the body becomes semi-verified, which is sufficient for the first firing. To those unacquainted with the firing of continuous gum-work, I would advise, in commencing the process, to use what is termed a test-piece; which is simply a piece of platinum wire about six inches long flattened at one end, on which is laid a little of the gum body or enamel; this may be removed from the furnace at intervals of a few minutes, and examined. The gasoline and air is then turned off, and the furnace is allowed to cool until the red heat has disappeared from the muffle, which may then be withdrawn, and the work allowed to thoroughly cool in the muffle at the furnace door. The work is then ready for a second application of the gum body, for the purpose of repairing any defects due to the shrinkage caused by the first firing. This done, the piece is again, fired allowing the second bake to be a little harder than the first, but not so much as to appear glossy. It is then allowed to cool as before, taking care to keep the muffle door closed, a precaution which must be observed after each baking.

The piece is now ready to receive an application of the gum enamel, which is mixed in the same manner as the gum body in an earthenware pot, or other suitable vessel. A thin layer is then to be put on with spatula and suitable camel-hair brushes, covering the whole surface of the body, varying the thickness so as to represent the different shades to be observed in the natural gum. The crowns of the teeth must be well marked, the gum well defined, and the rugæ of the palate well moulded and prominent, removing any superfluous moisture with small pieces of blotting paper. Great care should be taken to remove, with dry brushes, all particles of the gum body and enamel, or any other substance adherent to the crowns of the teeth, previous to firing. Having carefully put on the enamel, the piece is then ready for the final baking or firing, which should be conducted as advised for firing the body, excepting that the heat must be stronger, in order to produce a moderately glossy appearance of the enamel when fused. It is advisable not to remove the work from the muffle until it is quite cool; if cooled too rapidly it is rendered more fragile.

The piece is now to be boiled out in a very weak solution of sulphuric acid and water, preparatory to finishing the platinum plate in the usual way by filing, sand-papering, stoning, &c., and the final gilding process; which may be simply done in the following way:—Take 20 grains of waste gold stopping and put into a shallow evaporating dish with about two drachms of nitro-muriatic acid and evaporate nearly to dryness over a heated sand bath. Dissolve six drachms of cyanide of potassium in 24 oz. of distilled or rain water, and then add the chloride of gold. This is the gilding solution. The plate to be gilded should be well cleaned with powdered pumice stone in the lathe, and thoroughly washed in clean water. To gild the work, put it into a suitable vessel with sufficient gilding solution to cover the article, gently warming it over a sand-bath. A strip of clean sheet-zinc put into the solution and in contact with the plate will complete the gilding process, and give a very fine and rich coating of gold equal if not superior to gilding by the aid of a battery. The edges of the plate should finally be burnished with the agate burnisher and plenty of clean soapy water.

GOSSIP.

A CERTAIN London firm recently required to forward by post a large number of packets of samples, weighing about 3 oz. each. The postage for these is 2*d.* from any part of the United Kingdom to another, and 1*d.* to any of the countries included in the Postal Union. The samples were therefore shipped in bulk to Ostend, with the following result:—For 20*s.* are obtained 250 Belgian 10*c.* stamps, each available for the postage of a 4-oz. sample box to the United Kingdom; therefore, on the postage of each 250, the saving is £1 1*s.* 8*d.*, or 1*s.* 8*d.* less than half the English rate. This 1*s.* 8*d.* much more than pays the freight outwards. The customs entry and petty charges are nominal and inappreciable on large quantities, so that on the samples the actual saving was nearly 80*s.* per 1,000. The British Post Office received only about a third of a penny for their distribution.

THE International Pharmaceutical Congress, recently held in London, was the fifth of a series of meetings which have been held since the year 1865. One of the principal results of the past session has been the appointment of a Commission, to work in conjunction with a Commission of medical men appointed by the Pharmacological Section of the International Medical Congress. This International Pharmacopœial Commission is authorised to draft a scheme for the formation of an International Pharmacopœia, whereby the strengths of the more potent medicines will be equalised. At present the difference existing between some of these preparations, as ordered according to the pharmacopœias of different countries, are so great as to be dangerous when a prescription written in one country is dispensed in another.

INTERNATIONAL MEDICAL AND SANITARY EXHIBITION.—The awards to exhibitors of dental instruments, &c., were:—FIRST CLASS: Claudius Ash and Sons, General Excellence; Dental Manufacturing Company, General Excellence; Samuel S. White, General Excellence.—AWARD OF MERIT: Arnold and Sons, Forceps; W. and J. Jamieson, General Excellence; Maw, Son, and Thompson, Forceps and Pluggers; Mayer and Meltzer, Forceps; Millikin and Down, Forceps; G. W. Rutterford, General Excellence; Smale Bros., General Excellence; John Weiss and Son, Forceps; C. Wright and Co., Forceps. The Judges were:—George Ibbetson, F.R.C.S.; Edwin Saunders, F.R.C.S.; Charles S. Tomes, F.R.C.S.

THE last Preliminary Examination, under the direction and supervision of the Royal College of Surgeons of England, will be held on the 6th, 7th, and 8th inst., after which date all inquiries with respect to recognised preliminary examinations should be addressed to the Registrar of the General Medical Council, 299, Oxford Street, London, W.

The *Lancet* remarks that the President and Officers of Section XII.—Diseases of the Teeth—of the late Medical Congress, are to be congratulated on the success of this, the first occasion upon which Dental Surgery has received "international" recognition as an integral part of the Medical Profession.

Her Majesty the Queen has signified her pleasure to confer the honour of knighthood upon Mr. William MacCormac, in recognition of his able and arduous services as honorary general secretary of the recent International Medical Congress. He has also received the high distinction of the Cross of the Legion of Honour.

From a long series of investigations, Colonel Drayson, R.A., has come to the conclusion that the centre of gravity of the earth is located 1,115 feet north of the equator, and 2,100 feet distant from an axis joining the two poles. A meridian of 15° E. longitude passes through this centre of gravity.

Emil Fischer has published a new method of determining arsenic. The test consists in distilling the arsenical solution with hydrochloric acid and an excess of ferrous chloride, and then titrated with iodine. The operation takes four hours.

It is stated that Dr. Hahn, Dr. Weinland, and Prof. Karsten, have recognised about fifty species of fossil polypi, crinoids, sponges, and algæ in meteoric stones.

Mr. Jonathan Hutchinson, in his recent lectures at the College of Surgeons on the "Laws of Inheritance in Relation to Disease," stated that colour-blindness is exceptionally common among Jews and Quakers.

On the 17th of October Professor Bunsen, of Heidelburg, the eminent chemist, will have held for fifty years his diploma of doctor from the University of Göttingen.

Mr. Cox-Moore, L.D.S.I., has been appointed Dental Surgeon to the Bloomsbury Branch of the Metropolitan Medical Provident Association.

Mr. Frederick J. Bennett, M.R.C.S., L.D.S.Eng., has been appointed Dental Surgeon to the St. Marylebone General Dispensary.

Owing to the re numbering of Oxford Street, the Number of the Office of the General Medical Council will henceforth be 299.

Mr. Erasmus Wilson, F.R.S., has been elected President of the Royal College of Surgeons.

Mr. Charters White, M.R.C.S., has again been elected President of the Quequett Microscopical Society.

Dr. Bonwill (U.S.A.) has presented to St. Bartholomew's Hospital one of his dental engines, modified for surgical operations.

EDUCATIONAL SECTION.

SUGGESTIONS TO STUDENTS.

Before commencing his Professional Education, the student must pass a Preliminary Examination in arts. The examination most to be recommended is the matriculation of the University of London. Passing that examination will enable the student subsequently to present himself for an university degree, should he desire to do so. A list of the several examinations recognised by the General Medical Council as fulfilling the conditions required by that body as regards preliminary education, may be obtained on application to the Medical Registrar, 299, Oxford Street, London, W.

After passing a preliminary examination, the student must serve at least three years instruction in Mechanical Dentistry under a registered Dentist.

It should be distinctly understood that serving articles or apprenticeship to Mechanical Dentistry is considered as Professional Education.

Having received a certificate of his Preliminary Examination, and commenced his Professional Education, either by apprenticeship or by hospital studies, it is necessary to register the same at the Medical Council Office, 299, Oxford Street, London; or at the Branch Office for Scotland, 33, Albany Street, Edinburgh; or at the Branch Office for Ireland, 35, Dawson Street, Dublin. This must be done within fifteen days of the pupil commencing his professional studies. The commencement of such studies will not be recognised by any of the qualifying bodies as dating earlier than fifteen days before the time of registration.

Any one registered as a Medical student must also register as a Dental student, if he be such.

Any one who commenced his professional education before the 22nd July, 1878, is exempt from the Preliminary Examination.

Having served his articles, the student may enter a General or a Dental Hospital, or both, and complete four years of study from the date of registration; after which he is eligible to be admitted to examination for the Dental License.

Though the possession of the Licence in Dental Surgery is necessary for a name to be entered on the Dentists' Register, the student is strongly recommended to obtain some additional qualification in either Medicine or Surgery. On the other hand, though a Medical or a Surgical, other than the special Dental, qualification, entitles its possessor to practise Dentistry, yet the course of study for such does not include any Dental instruction. Therefore, to be a Dentist, requires a more or less complete compliance with the Dental Curriculum.

REGULATIONS OF THE VARIOUS EXAMINING BODIES FOR THE DIPLOMA IN DENTAL SURGERY.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Candidates are required to produce the following Certificates :—

1. Of being twenty-one years of age.
2. Of having been engaged during four years in the acquirement of professional knowledge.
3. Of having attended, at a school or schools recognised by this College, not less than one of each of the following courses of lectures, delivered by lecturers recognised by this College, namely : Anatomy, Physiology, Surgery, Medicine, Chemistry, and Materia Medica.
4. Of having attended a second winter course of lectures on Anatomy, or a course of not less than twenty lectures on the Anatomy of the Head and Neck, delivered by lecturers recognised by this College.
5. Of having performed dissections at a recognised school during not less than nine months.
6. Of having completed a course of chemical manipulation, under the superintendence of a teacher or lecturer recognised by this College.
7. Of having attended, at a recognised hospital or hospitals in the United Kingdom, the practice of surgery and clinical lectures on Surgery during two winter sessions.
8. Of having attended, at a recognised school, two courses of lectures upon each of the following subjects, namely:—Dental Anatomy and Physiology (Human and Comparative), Dental Surgery, Dental Mechanics, and one course of lectures on Metallurgy, by lecturers recognised by this College.
9. Of having been engaged during a period of not less than three years, in acquiring a practical familiarity with the details of Mechanical Dentistry, under the instruction of a competent practitioner. In the cases of qualified surgeons, evidence of a period of not less than two, instead of three years, of such instruction will be sufficient.
10. Of having attended at a recognised Dental Hospital, or in the Dental Department of a recognised General Hospital, the practice of Dental Surgery during the period of two years.

Note.—All Candidates who shall commence their professional education on or after the 22nd July, 1878, will, in addition to the certificates enumerated in the foregoing clauses, be required to produce a certificate of having, prior to such commencement, passed the preliminary examination in general knowledge for the diploma of Member of the College, or an examination recognised as equivalent to that examination.

Candidates who were in practice as Dentists, or who had commenced their education as Dentists prior to September, 1859—the date of the Charter—and who are unable to produce the certificates required by the foregoing Regulations, shall furnish the Board of Examiners with a Certificate of Moral and Professional Character, signed by two Members of this College.*

Together with answers to the following inquiries :—

Name Age Professional Address.

If in practice as a Dentist, the date of the commencement thereof.

Whether Member or Licentiate of any College of Physicians or Surgeons of the United Kingdom; and if so, of what College.

Whether Graduate of any University in the United Kingdom; and, if so, of what University; and whether Graduate in Arts or Medicine.

The date or dates of any such Diploma, License, or Degree.

Whether Member of any Learned or Scientific Society; and, if so, of what.

Whether his Practice as a Dentist is carried on in connection with any other business; and, if so, with what business.

Whether, since 22nd July, 1876, he has employed Advertisements or Public Notices of any kind in connection with the practice of his Profession.

The particulars of Professional Education, Medical or Special.

The Board of Examiners will determine whether the evidence of character and education produced by a Candidate be such as to entitle him to Examination.

Professional Examinations.

The examination is written, oral, and practical.

The written examination comprises General Anatomy and Physiology, and General Pathology and Surgery, with especial reference to the practice of the Dental Profession.

The oral and practical examinations comprise the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, and by operations, &c.

Members of the College, in the written examination, will only have to answer those questions set by the Section of the Board consisting of persons skilled in Dental Surgery; and in the oral and practical examinations will be examined only by that Section.

A Candidate whose qualifications shall be found insufficient will be referred back to his studies, and will not be admitted to re-examination within the period of six months, unless the Board shall otherwise determine.

Examinations will be held in January and June.

The Fee for the Diploma is Ten Guineas, over and above any stamp duty.

Note.—A ticket of admission to the Museum, to the Library, and to the College Lectures, will be presented to each Candidate on his obtaining the Diploma.

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* N.B.—In the case of Candidates in practice, or educated in Scotland or Ireland, the Certificate of Moral and Professional Character may be signed by two Licentiates of the Royal College of Surgeons of Edinburgh, or the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Surgeons in Ireland, as the case may be.

Syllabus of Examinations.

In addition to the Special Examination by the Dental Section of the Board of Examiners, Candidates are expected to answer questions in the written and *vivâ voce* Examinations on the following subjects:—

ANATOMY AND PHYSIOLOGY.

The names of the Bones, and of their more important parts and their articulations.

The names and position of the principal Arteries, Veins, and Nerves.

The form and relations of the Viscera of the Head, Chest, and Abdomen, and an elementary knowledge of their structure.

An elementary knowledge of the structure and properties of the principal tissues.

An elementary knowledge of the functions of Digestion, Absorption, Circulation, Respiration, Secretion, Motion, and Sensation.

The Surgical Anatomy and Physiology of the Organs of Mastication, Deglutition, Taste, and Articulation.

PATHOLOGY AND SURGERY.

Inflammation and its consequences.

The healing of Wounds.

The methods of arresting Hæmorrhage.

The union of Fractures.

The signs of Asphyxia, and the treatment of threatened death from Anæsthetics.

The injuries and diseases of the Jaws, Mouth, Fauces, and adjacent parts.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

PRELIMINARY EXAMINATION.

Candidates for the Dental Diploma must produce evidence of having attained the age of twenty-one years, and will require to produce a Certificate of having passed the Preliminary Examination in General Education required for the ordinary License in Surgery, or an examination equivalent to this, and recognised by the General Medical Council,—except in the case of Candidates who shall have commenced their professional education previous to the first day of August, 1878.

Candidates will also be required to produce Certificates of having been engaged during four years in the acquirement of professional knowledge, and of having been during that period, or at some time previous to their examination, engaged for not less than three years in the acquirement of a practical knowledge of Mechanical Dentistry with a practitioner registered under this Act.

The following Lectures and other Courses of Instruction must have been attended by Candidates for the Dental Diploma, at a recognised Medical School or Schools; and the number of Lectures in each of the general courses must correspond with those required for the Surgical Diploma of the College:—

ANATOMY	One Winter Course.
DISSECTION AND DEMONSTRATIONS, or	Nine Months.

Dissection .. .. .. and	Nine Months.
Anatomy of Head and Neck	One Course of Twenty Lectures.
Physiology	One Course of not less than Fifty Lectures.
Chemistry	One Winter Course.
Surgery	One Winter Course.
Medicine	One Winter Course.
Materia Medica	One Course of Three Months.
Practical Chemistry and Metallurgy	One Course of Three Months.
Clinical Instruction in Surgery at a Recognised Hospital	One Course of Six Months, or Two Courses of Three Months.

In addition to these, Candidates will require to have attended the following Special Courses of Lectures and Instructions, in terms of the Curriculum, and by teachers recognised by this College :—

Dental Anatomy and Physiology	One Course of each.
Dental Surgery and Pathology	
Dental Mechanics	

Two Years' Attendance at a Dental Hospital, or the Dental Department of a General Hospital, recognised by the College.

Candidates who are Licentiates of this College, or who may be registered Medical Practitioners, will require to produce Certificates of Attendance on the special subjects only, and will be examined in these only for the Dental Diploma.

SUBJECTS OF EXAMINATION.

The ordinary subjects of Examination will be Anatomy, Physiology, Chemistry (including Metallurgy), Surgery, Medicine, and Materia Medica; and the special subjects will be Dental Anatomy and Physiology, Dental Surgery and Pathology, and Dental Mechanics. Anatomy, Chemistry (with Metallurgy), and Physiology, will form the subjects of the first Examination; Surgery, Medicine, Materia Medica, and the special subjects, those of the second.

TITLE AND DIPLOMA.

Those Candidates who pass this Examination shall be entitled to the designation of Licentiate in Dental Surgery of the Royal College of Surgeons of Edinburgh, and shall obtain the Dental Diploma of the Royal College. Each Candidate, before receiving his Diploma, shall, in entering his name in the books of the College, sign the following declaration :—

> I hereby promise faithfully to maintain and defend all the rights and privileges of the Royal College of Surgeons of Edinburgh, and to promote its interests to the utmost of my power. I promise, in the event of my admission as a Dental Licentiate of that College, to refrain from advertising or employing any other unbecoming modes of attracting business, and I shall not allow my name to appear in connection with any one who does so. I also promise to obey all the laws of the said Royal College, made or to be made.

FEES, &C.

The fee for the Dental Diploma shall be ten guineas. Each Candidate for the first examination, shall pay to the Secretary of the College the sum of four guineas, not later than nine a.m. of the Saturday preceding the ordinary examinations; and in the event of a Candidate being unsuccessful, two guineas will be returned to him. Where the Candidate is successful, the sum of four guineas will be considered as paid to account of the diploma. Each Candidate for the second examination shall pay to the Secretary of the College the sum of six guineas not later than nine a.m. of the Tuesday preceding the second examination; and in the event of his being unsuccessful, three guineas will be returned to him. No Candidate will, if unsuccessful, be remitted for a shorter period than three months. These Rules will apply to any subsequent rejection.

EXAMINATIONS SINE CURRICULO.

Candidates who were in practice before the first day of August, 1878, or those not in practice, but who had commenced their apprenticeship as Dentists before the first day of August, 1875, and who are unable to furnish the Board of Examiners with the certificates of lectures and hospital attendance required by the foregoing regulations, shall fill in the schedule of application as follows:—

1. Full name, age, and address of Candidate.
2. Certificate of moral and professional character, signed by two registered medical practitioners.
3. The date of commencing practice or apprenticeship as a Dentist, and whether, if in practice, such practice has been carried on in conjunction with any other business, and if so, with what business.
4. Whether he has any degree or diploma in medicine or surgery, and if so, from what college or university, or other body, and at what time it was obtained.
5. The particulars of professional education.

The President's Council shall, on such information being afforded them, determine whether or not the Candidate may be admitted to examination for the Dental Diploma, and such examination shall, with the exception of the preliminary examination, and the exemptions in favour of Registered Medical Practitioners, as before explained, be passed on the same subjects and in the same manner as is required for other Candidates, and will confer the same privileges.

The following will be the periods of examination for the year 1881-82:—

I. PRELIMINARY EXAMINATIONS IN GENERAL EDUCATION.

On Saturday and Monday, October 15th and 17th, 1881. (The future dates are not yet fixed.)

II. FIRST PROFESSIONAL EXAMINATIONS.

On Tuesday, October 18, 1881.
On Tuesday, January 24, 1882.
On Tuesday, March 28, 1882.
On Tuesday, April 18, 1882.
On Tuesday, July 18, 1882

III. SECOND PROFESSIONAL EXAMINATIONS.

These will take place after the conclusion of the first professional examinations, at each of the above-mentioned periods. They will generally be begun on the Thursday succeeding the day of the first examination, and in no case on an earlier day.

SYLLABUS OF EXAMINATION.

In addition to a particular acquaintance with Dental Anatomy, Physiology, and Surgery, Candidates are expected to possess a general knowledge of, at least, the following subjects of examination :—

ANATOMY AND PHYSIOLOGY.

1. The Skeleton in general ; the anatomical characters and articulations of the Bones ; with the Muscles of the Inferior Maxilla and Upper and Lower Extremities.
2. Names and positions of the principal Bloodvessels and Nerves, and of the Viscera of the Chest and Abdomen.
3. General Anatomy of the Brain and Intercranial Nerves.
4. General knowedge of the functions of Circulation, Respiration, and Sensation.
5. An elementary knowledge of Histological Structures.

CHEMISTRY.

1. The Laws of Combination.
2. Sources or preparation and chemical properties of Oxygen, Hydrogen, Nitrogen, Carbon, Sulphur, and Chlorine.
3. A general acquaintance with the Chemistry of Potass, Soda, Ammonia, Iron, Lead, Gold, Copper, Zinc, Arsenic, and Mercury.

MEDICINE, SURGERY, AND MATERIA MEDICA.

1. The nature and treatment of Inflammation, Hæmorrhage, Asphyxia, Syncope, Wounds, and Fractures ; along with an Elementary knowledge of Diseases in general.
2. A general knowledge of the action of Narcotics, Emetics, Purgatives, Depressants, and Stimulants, with examples of the commoner substances used as each, and the modes of their prescription.

PROFESSIONAL EDUCATION REQUIRED BY THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The regulations of the Faculty of Glasgow do not materially differ from those of the Royal College of Surgeons of Edinburgh.

The following are the periods of the Dental Examinations for 1881-82 :—

First Examination.

Tuesday	October, 1881.
Tuesday	January, 1882.
Friday	April, 1882.
Friday	July, 1882.

The *Second Examination* will take place on the day following the First Examination.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

After the 1st day of August, 1881, (?) no Candidate shall be admitted to Examination who has not pursued the following curriculum, and lodged with the Registrar of the College, at least a fortnight previous to Examination :—

1. A Certificate of having attained the age of twenty-one years.
2. A Certificate of having been engaged during four years in the acquirement of professional knowledge.
3. Certificates from two Fellows or Licentiates of any College of Surgeons in the United Kingdom, and from two Dentists of repute, testifying that the Candidate is of good character.
4. A Certificate of having passed the Examination in Preliminary Education of one of the Examining Bodies recognised by the General Medical Council.
5. A Certificate of having lodged in the Bank of Ireland, to the credit of the College, the fee of Ten Guineas, half of which shall be returned to any Candidate who fails to satisfy the Examiners ; and no Candidate can present himself for re-examination for six months.
6. Certificates of having attended in a recognised school —
    One Course of Lectures on Anatomy and Physiology.
    Two Courses of Dissections, with Demonstrations.
    One Course of Lectures on Surgery.
    One Course of Lectures on Chemistry.
    One Course of Practical Chemistry, and Metallurgy.
    One Course of Lectures on Materia Medica, and
    Two Courses of Lectures on Dental Surgery, including Dental Mechanics.
7. Certificates of having attended General Hospital Practice for Two Winter Sessions; and the Dental Department of a General Hospital, or a Special Dental Hospital, for a further period of nine months.
8. A Certificate of having been engaged during, at least, three years in acquiring a practical knowledge of Dentistry, under the instruction of a Registered Licentiate in Dentistry of one of the Licensing Bodies.

The Examinations shall include all the subjects of the foregoing curriculum, and shall be partly Written and partly Oral, preparations, microscopes, and other appliances being used.

Licentiates in Surgery, or Fellows of any College in the United Kingdom, and Graduates in Surgery of any University recognised by this College, will be examined only in subjects special in Dentistry.

N.B.—Every successful Candidate, previous to receiving the Licence, shall declare that he will not advertise, or pursue any other unbecoming mode of attracting business, so long as he holds the Licence in Dentistry of the College.

SPECIAL DENTAL SCHOOLS.

THE DENTAL HOSPITAL OF LONDON, LEICESTER SQUARE.

DENTAL ANATOMY AND PHYSIOLOGY.

By Chas. S. Tomes, M.A., F.R.S., &c.—On Wednesdays and Fridays, at 8 a.m., during the Summer Session.

DENTAL SURGERY AND PATHOLOGY.

By Alfred Coleman, F.R.C.S., &c.—On Tuesdays and Thursdays, at 8 a.m., during the Summer Session.

DENTAL MECHANICS.

By Joseph Walker, M.D., &c.—On Wednesdays, at 5 p.m., during the Winter Session.

METALLURGY.

By Dr. Louis.—On Tuesdays and Fridays, at 12 o'clock, during the Winter Session.

Fees for two years' Hospital Practice and the Lectures, £31 10*s.*

T. F. Ken Underwood, Dean.

NATIONAL DENTAL HOSPITAL AND COLLEGE, GREAT PORTLAND STREET.

DENTAL ANATOMY AND PHYSIOLOGY.

By Thomas Gaddes, L.D.S.Eng. and Edin.—On Tuesdays and Thursdays, at 7 p.m., during October, November, and December.

DENTAL SURGERY AND PATHOLOGY.

By ————.—On Tuesdays and Fridays, at 8.30 a.m., during May, June, and July.

DENTAL MECHANICS.

By Harry Rose, L.D.S.Eng.—On Mondays, at 7 p.m., during January, February, and March.

DENTAL METALLURGY.

By Alfred Tribe, F.I.C., F.C.S.—On Tuesdays, at 9 a.m., during January, February, and March.

OPERATIVE DENTAL SURGERY.

By W. Finley Thompson, M.D., D.D.S.—On Wednesdays, at 7 p.m., during October and November.

DEMONSTRATIONS IN DENTAL MECHANICS.

By W. R. Humby, L.D.S.Eng.—On Wednesdays, at 7 p.m., during January, February, and March.

DEFORMITIES OF THE MOUTH.

By Oakley Coles, L.D.S.Eng.—On Fridays, at 8 p.m., during February and March.

THE ELEMENTS OF HISTOLOGY.

By Thomas Gaddes, L.D.S.Eng. and Edin.—On Wednesdays and Fridays, at 7 p.m., during May, June, and July.

ARTS AND LITERATURE CLASS.

Conducted by the Rev. H. R. Belcher, M.A., D.C.L.

Fees for two years' Hospital Practice and the Lectures, £25 4*s*.

THOMAS GADDES, Dean.

QUEEN'S COLLEGE, BIRMINGHAM, AND BIRMINGHAM DENTAL HOSPITAL.

The teaching of Dentistry is now undertaken by the Queen's College, acting in association with the Birmingham Dental Hosptal and the Birmingham Clinical Board, so that Students may fully qualify themselves for the Dental diploma of the Royal College of Surgeons.

The Dental Hospital is centrally situated, near the College, and is open daily (Sundays excepted). The number of patients treated in 1880 was 3,974.

DENTAL ANATOMY AND PHYSIOLOGY.

By F. R. Batchelor, L.D.S.I.—On Thursdays, at 5 p.m., during the Winter Session.

DENTAL SURGERY AND PATHOLOGY.

By Thomas Hawkins, M.R.C.S.—On Fridays, at 5 p.m., during the Winter Session.

DENTAL MECHANICS.

By Charles Sims, L.D.S.Eng.—On Wednesdays, at 6 p.m., during the Summer Session.

DENTAL METALLURGY.

By A. Bostock Hill, M.D., F.I.C.—On Mondays, Tuesdays, Thursdays, and Fridays, at 1 p.m., during January, February, and March.

A Composition Fee of Seventy-five Guineas is received for the full curriculum required for the Dental diploma, and is to be paid to the Warden at Queen's College. This Composition Fee may be paid in one sum, or must be paid Fifty Guineas at the beginning of the first year, and Twenty-five Guineas at the beginning of the second year, when taken consecutively. JOSEPH LEWIS, Secretary.

DENTAL DISPENSARY AND SCHOOL, OCTAGON, PLYMOUTH.

DENTAL ANATOMY.

By F. H. Balkwill, L.D.S.Eng.

DENTAL PHYSIOLOGY.

By C. Spence Bate, F.R.S., &c.

DENTAL MECHANICS.

By W. V. Moore, L.D.S.Eng.

The Fee for Lectures and Dispensary Practice is £23 2*s*.

E. G. BENNETT, Hon. Sec.

LIVERPOOL DENTAL HOSPITAL, MOUNT PLEASANT.

Fees for Hospital Practice.—Five Guineas per annum to Students of the Liverpool Royal Infirmary School of Medicine, and pupils or apprentices of registered Dentists. Pupils and apprentices of the Honorary Dental Surgeons shall have the privilege of attending the practice of the Hospital free of expense.

W. L. Jackson, Hon. Secretary.

EDINBURGH DENTAL HOSPITAL AND SCHOOL, CHAMBERS STREET.

DENTAL ANATOMY AND PHYSIOLOGY.

By Andrew Wilson, L.D.S.Edin.—On Mondays and Fridays, at 8 p.m., commencing November 7th.

DENTAL SURGERY AND PATHOLOGY.

By George W. Watson, L.D.S.Edin.—On Tuesdays and Fridays, at 8 p.m., commencing May 2nd, 1882.

MECHANICAL DENTISTRY.

By W. Bowman Macleod, L.D.S.Edin. – On Wednesdays, at 8 p.m., commencing November 9th.

PRACTICAL MECHANICS.

Assistant Demonstrator—J. Stewart Durward, L.D.S.Edin. The Demonstrations will be spread over the two years of Hospital Practice, and will be given as occasion serves.

GOLD FILLING.

By C. Matthew, L.D.S.Edin.

This course, consisting of ten Demonstrations, will commence on Monday, the 1st of May, and be continued every Monday and Thursday until the course be completed.

Fees for Hospital Practice and Lectures, £25 10*s*. This does not include the fee of £2 4*s*. for second courses of lectures required by the Royal College of Surgeons of England.

W. Bowman Macleod, Dean.

ANDERSON'S COLLEGE—DENTAL HOSPITAL AND SCHOOL—GLASGOW.

DENTAL ANATOMY AND PHYSIOLOGY.

By David Taylor, M.B., L.D.S.Glas.—On Wednesdays and Fridays, at 8 a.m., during Summer Session.

DENTAL SURGERY AND PATHOLOGY.

By J. R. Brownlie, L.D.S.Eng.—On Tuesdays and Thursdays, at 8 a.m., during Summer Session.

MECHANICAL DENTISTRY.

By W. S. Woodburn, L.D.S.Glas.—On Thursdays, at 8 p.m., during Winter Session.

The Fee for two years' Hospital Practice is £10 10*s*.

DENTAL HOSPITAL OF DUBLIN, BERESFORD PLACE.

The Fee for Dental Practice is £3 3*s*. for one Session, and £5 5*s*. for two Sessions.

H. G. Sherlock, Hon. Sec.

GENERAL MEDICAL SCHOOLS.

CHARING CROSS HOSPITAL, W.C.

The Composition Fee for Dental Students is £42 2*s*.

Francis Hird, Dean.

GUY'S HOSPITAL, BOROUGH, S.E.

Fee for attendance on the Hospital Practice and Lectures required for the Dental Diploma of the College of Surgeons, 63 guineas, or in two annual instalments of 40 guineas and 23 guineas. The above fee does not include £1 10*s*. for Practical Chemistry.

Dr. F. Taylor, Dean.

KING'S COLLEGE, STRAND, W.C.

No special arrangements are made for Dental Students.

LONDON HOSPITAL, MILE END, E.

Composite fee for Dental Students—Hospital Practice and Lectures, £42. This does not include the fee of £2 2*s*. for Practical Chemistry.

Munro Scott, Warden.

MIDDLESEX HOSPITAL, BERNERS STREET, W.

Students who intend to become Licentiates in Dental Surgery of the Royal College of Surgeons are admitted to attend the requisite Courses of Lectures and Hospital Practice on payment of a fee of Forty Guineas, in one sum on entrance, or by instalments of Thirty Pounds on entrance, and Fifteen Pounds at the beginning of the second Winter Session.

Andrew Clark, Dean.

BARTHOLOMEW'S HOSPITAL, SMITHFIELD, E.C.

Fee for General Subjects for Students of Dental Surgery:—First Winter, 31½ guineas; First Summer, 31½ guineas; or a single payment of 63 guineas.

Norman Moore, M.D., Warden.

ST. GEORGE'S HOSPITAL, GROSVENOR PLACE, S.W.

Fee for General Subjects required for the Diploma in Dental Surgery, including Practical Chemistry, £55; payable in two instalments,—first year, £30; second year, £25.

Dr. Wadham, Dean.

ST. MARY'S HOSPITAL, PADDINGTON, W.

Entrance fee to the Hospital Practice and Lectures required for the examination in Dental Surgery at the Royal College of Surgeons, England, £65 12*s*. 6*d*. This sum may be paid by instalments by arrangement.

A. B. SHEPHERD, M.D.

ST. THOMAS'S HOSPITAL, ALBERT EMBANKMENT, S.E.

The fee for attendance on the *general* subjects required of Students in Dental Surgery, is for the two years £55; or by instalments, £50 for the first year, and £10 for the second year.

DR. GILLESPIE, Secretary.

UNIVERSITY COLLEGE, GOWER STREET, W.C.

No special arrangements are made for Dental Students.

WESTMINSTER HOSPITAL, BROAD SANCTUARY, S.W.

The Fees for the General Surgical Practice and Lectures required for the Dental Diploma of the Royal College of Surgeons may be paid in one of two ways, viz.:—1. In one payment on entrance, £50. 2. In two payments of £32 10*s*. and £20, to be made respectively at the commencement of each academic year. These payments include the Library fee, and entitle the Student to attendance on the Tutorial Classes.

DR. ALLCHIN, Dean.

INTERCOMMUNICATIONS.

QUESTIONS.

(3.) JUVENIS writes:—What therapeutical effect ought one expect to be produced by the swallowing of a ball of pure metallic mercury about the size of a duck shot? This accident occurred in my practice, while dissolving out an old amalgam filling from a carious tooth. I have always understood that mercury in the metallic form would pass through the alimenrary canal without producing any inconvenience; but in this case the young lady was very ill for a whole day, being seized with violent pains in the stomach an hour after leaving the house. I naturally feel anxious to ascertain whether this was caused by the mercury; or was it only a coincidence?

(4.) J. T.—What is the best solvent for vulcanized rubber?

(5) ZERO asks:—Why thermometers, after being used for high temperatures, should vary in the accuracy of registering lower degrees of heat?

Communications.

Communications received from Frank Comer, Torquay; Dr. E. Parmly Brown, London; Dr. Campbell, London; Walter Coffin, London; J. S. Turner, London; F. Rose, Liverpool; Thomas Fletcher, Warrington; J. T., &c.

Books, &c., Received.

"Correspondenz Blatt;" "Inventors' Record and Industrial Guardian;" "Calendars" of St. Bartholomew's, St. Mary's, St. Thomas's, St. George's, Charing Cross, King's College, Guy's, Middlesex, London, Westminster, University College, and the London Dental Hospitals; the National Dental Hospital and College, Liverpool Dental, Queen's College, Birmingham, and Edinburgh Dental Hospitals.

THE

DENTAL RECORD.

VOL. I. OCTOBER 1, 1881. No. 4.

THOUGHTS—COMPARISONS—REFLECTIONS.

AN ANSWER TO MR. FLETCHER'S "REPLY."

By JOHN LAWS, L.D.S.I.

IN starting a new periodical, I believe one of an editor's chief anxieties is to obtain a goodly staff of contributors. I did not observe the name of Fletcher amongst those you had secured, and which were published in your first issue; but, methought, on reading your last number, that so long as that gentleman remains amongst us, the editors of our Dental or of any other scientific journals need have little cause to fear that they will not be well supplied with material for publication; for, if Mr. Fletcher cannot for the time being contribute anything particularly novel, he is always ready to entertain your readers with a statement of his "wrongs." And, whilst complaining of the "unjust" manner in which "he," or his "filling materials," or his "statements" are received, or handled, or commented upon by others, he is "unjust" enough himself to impute to others "omissions," "failures," and "causes for failures," which he cannot substantiate, and, moreover, which are altogether wide of the mark. If it is any consolation to Mr. Fletcher, let me tell him that no man reads the instructions sent out with each of our filling materials more carefully than I do; and, so far as I am capable of understanding the English language, I carry out those instructions to the letter, and here declare that I did so in making the experiments which I ventured to chronicle in your August issue.

So much for the *general imputations* of Mr. Fletcher against me; now for the particular ones. Mr. Fletcher at once jumps to the conclusion that I used his porcelain *too old*, and charges me (unjustly) with paying no heed to the tests by which its deterioration may be detected, or the date of its manufacture learned. In reply to those imputations, I will merely state that I used his porcelain on the occasion I mentioned within five days of receiving the same from Messrs.

Smale Brothers' Depôt; and, further, that to the letter his instructions were carried out. If it is impossible for a Dental Surgeon possessing a fair education and *ordinary* abilities and capabilities (and I lay claim to nothing more) to understand and carry out the instructions Mr. Fletcher gives with his materials, then why does he print them so lavishly? Why not spare the printer, the ink, and his own expenses, if the results are alike whether printed or no? or, if he believes beforehand that they will neither be read nor heeded?

In a word, let me say, the imputation that I used "stale porcelain," or did not carry out Mr. Fletcher's instructions, is misapplied. The result of my experiments as a consequence, I am quite willing to leave to the judgment and criticism of brother practitioners.

Mr. Fletcher takes high umbrage at my daring to state that "he has marred his fame with premature assertions." If it were needed, the very article in your last number, against which I am defending myself, is a full proof of my statement; for in it he makes four or five assertions imputing to me certain sins of omission and commission of which I am altogether innocent, and which have not the slightest foundation. But should this not be sufficient, will Mr. Fletcher tell us what has become of his *justly celebrated* "*Permanent* Translucent Filling?" the advent of which, heralded in a manner never before known in our profession, so many practitioners have only too great a cause to remember, *and regret.*

If anything further were necessary to show how impolitic is the offence Mr. Fletcher has taken at my last article, or how equally ill-advised his attack upon me is, consisting as it does from first to last of unfounded and "premature" assertions and imputations, his last paragraph is surely sufficient. I do not hesitate to assert, that any practitioner who inserts an amalgam plug so that it can be "shaken" in the way Mr. Fletcher describes is not worthy of the name Dental Surgeon; and further, I will defy Mr. Fletcher to "shake" any amalgam plug I insert in the manner he indicates. If this paragraph referred to is meant as a joke, all is well; if it is meant to be taken seriously, I am sorry for Mr. Fletcher, I am sorry for the operator (?) he came in contact with, and, more than all, especially sorry for the amalgam that "shook."

The whole thing resolves itself into this. Mr. Fletcher apparently has a very strong objection to having his filling materials, or other wares, criticised in our journals, or "compared" with others that are in the market. That his objection is natural may be, but I was not before aware that such criticisms or comparisons were "unjust." I was not before aware that the numerous publications which emanate from Museum Street, Warrington, were absolutely infallible, and that to question them was but to expose one's ignorance. I was not before aware that "ignorance" or "neglect of instructions," or "incapability" of comprehending our mother-tongue, was to be imputed to us because we failed to do as permanent and satisfactory work with the materials exclusively vended by Mr. Fletcher, as with gold.

If Mr. Fletcher will read again and *carefully* the article which has given him so much offence, and which he characterises as "unjust," he may perhaps be able to perceive that the only *assertion* it contains is to the effect that, so far as we have yet gone, in spite of the innumerable articles daily on sale and daily being invented, gold is the only reliable *permanent* filling material we yet possess, and that all others hold but a very secondary position to it. I am quite willing to leave it to the decision of the profession to say if am wrong, or have been "unjust" to Mr. Fletcher. In making that assertion I took care to give "all honour" to him and others for the pains they had been at in endeavouring to find out a better material, even though "as yet their efforts have been unsuccessful." For this I am designated "unjust."

I should not have encroached so far upon your space with this "answer," but that I felt it was only just to myself to expose the fallacy of Mr. Fletcher's "reply." If I write anything further to which Mr. Fletcher objects, and he desires to open a discussion, he must confine himself strictly to facts, and not stoop to insinuations and "unjust" imputations. Such attacks only produce unprofitable discussions, and are very far from affecting or even furthering any scientific attainments, for such "Life is all too short," "Time too fleeting."

OXYCHLORIDE AND COTTON WOOL FILLINGS.

Mr. James Hardie (Alloa) writes :—As a filling for children's temporary teeth, and also for fragile shells in adults, I find that a combination of oxychloride filling and cotton wool gives most satisfactory results, as it stands well even on masticating surfaces. The manner of preparing it is as follows : Mix upon the glass slab the oxychloride, a little thinner than for ordinary use; place a piece of cotton wool on the slab, about half the quantity necessary to fill the cavity, and work the oxychloride well into it with the spatula before putting into the tooth. When finished off cover with mastic varnish or collodion to keep it free from the action of the saliva whilst setting.

PLAN FOR WORK ROOM BOOK.

MEMORANDA OF MECHANICAL WORK.

By C. J. Wallis, L.D.S.Eng.

Date 1881, and Number.	Name.	No. of Teeth.	Color.	Wght. of Gold at Finish	To try in.	Finish for.	Description of Case (or Work).	Ap-proxte. Cost.	Fee Charged.	√
July 18 2400	Smith, Mrs. J. .. 24, London Street.	14 — 8	B.2 — B.3	14·12 —— 9·0	Take bite, &c., on Tues. 19th, 10 a.m. Try plates, &c., Wed. 20th, 10 a.m.	Mon. 25th, 10 a.m.	Gold Upper suction with tube Teeth. Gold bar Lower, with two bands, & Vulcanite Teeth.	ab/- ab/-	£ s. d. 25 0 0	√
,, 19 2401	Jones, Mr. T. .. 12, Edinburgh Sq.	14 — 14	B.3 — B.4	..	Take bite, &c., Thurs. 21st, 9 a.m.	Sat. 23rd, 2 p.m.	Vulcanite Upper with air chamber, and American Teeth, Vulcanite lower. Gold swivels and springs.	ab/-	21 0 0	√
,, 20 2402	Robinson, Miss .. 36, Dublin Street.	2 — 0	B.2	..	..	Friday 22nd, 4 p.m.	Repair: two Teeth added to Gold Upper. ,, fractured Lower Vulcanite repaired.	.. ..	1 11 6 1 1 0	√
,, 21 2403	Bell, Master .. 48, Essex Terrace.	..	..	..	..	Wed. 27th, 3 p.m.	Regulation: Upper Vulcanite plate with Gold wires.	..	2 2 0	√
,, 22 2404	McIntyre, Mr. .. Leith Villa.	14 -- 0	B.3	..	Take bite, &c., Mon. 25th, 9 a.m.	Thurs. 28th, 5 p.m.	Celluloid upper suction case.	..	12 12 0	√
,, 23 2405	Mahoney, Mrs. .. Dublin Street.	..	..	..	..	Tues. 26th, 3 p.m.	Repair: Gold Upper fracture, repaired and strengthened.	..	1 1 0	√
,,	Essex, Master ..	..	..	..	..	Wed. 27th, 4 p.m.	Regulation: Upper Vulcanite plate with dent alloy struck over molars to bite.	..	3 3 0	√

The convenience of a well arranged and well kept work room book as a medium of reference, is very great, whether in a large or small practice; and it is also useful as showing the amount of work done, of which every purchaser would want to know something in the event of the practice being for sale. By this method one would see at a glance what had been done for a patient, and what fee was charged for mechanical work carried out at any previous time, and so be able to judge as to future charges, or to settle disputes regarding fees. Additions might be made to this arrangement, but I think this embraces all particulars that one wants, or, at any rate, that one would be likely to keep accurately. I think it is sufficiently clear to need but little explanation. The column under "*weight of gold at finish*" might, perhaps, be simply "*weight of gold.*" A column is reserved for a statement of the approximate cost of the whole case, or simply of the gold used, as one may desire to note. This note and the fee charged may be marked in plain figures or private symbols; whilst the last column is for the purpose of ticking off the case when finished.

DENTAL ETHICS.

By F. J. Van der Pant, L.D.S.I.

In this latter part of the nineteenth century, which has more than two-thirds run its course, what high aspirations have been indulged in, what glorious opportunities of making it memorable to all time—a veritable golden age—have presented themselves to "the giants of the earth." The indomitable will of man has passed like a huge wave over the impossible, creating and discovering new worlds to conquer, and joining, as in a web, old worlds with new; causing and producing, by the union of mighty intellectual engines, through the power of electricity, the most wonderful effects that are possible to conceive. Keeping within the limits of our own vocation, was there ever such a time known, or even dreamt of at any former period of our history? But with it all, I would ask, have the unwritten laws which govern a profession, like a nation or community, been equally considered? We hear much about professional conduct, and the high moral tone of assumption which is prone to misconstrue the purest motives which may not happen to run in its own narrow groove. With all the vaunted liberality of an enlightened epoch, I fear the boast in many instances is little better than a conventionality.

With such a free interchange of thought as was evidenced at the late great gathering—the International Medical Congress—, why should we be bid to turn from the friendly-offered proffers of instruction on certain subjects, in which we cannot but admit our inferiority? and the treasures of inventive skill so freely thrown open by our "kinsmen once removed," we are forbid to accept, on pain of causing a shudder to pass through the frames of some of our oracles, which might in time lead to more disastrous results—to wit, a shaking of their conceptive faculties to the manifest dismay of the whole community! Why, I would again ask, should such things be? Are they in keeping with the progress that we see around us, or are they calculated to arouse that inner fire of enthusiasm which must be smouldering in the breasts of at least a few of us? I take it that true liberality means something very different, indeed, from such unworthy sentiments which are in no wise calculated to produce real independence. There can be no breach of professional morality in evincing a desire to learn, even at the awful expedient of offering a *quid pro quo.* If our friends across the water are willing, nay, desirous, of sharing with us the results of their labours, why should we not accept them, and be thankful, too, that our obligations are not made too onerous? In what is thoroughly honest and above-board, we need not fear any man; and we may even risk the shuddering displeasure of those so-called teachers who could not take for their motto, "Freely ye have received, freely give." We may find comfort in the thought, that what we learn of others, who are capable of imparting instruction on things not generally known, or taught in our schools, may benefit ourselves, perhaps; but, without doubt, we are enabled to do more good in our generation by ameliorating the sufferings of humanity, and thereby obeying a precept set forth by the Great Teacher of men. If our ethics are so considered and upheld in a manly and reasonable spirit, and devoid of mock sentiment, we need not fear any diminution of lustre, either in the present or the future history of our profession.

THE TENDINOUS INTERSECTION OF THE DIGASTRIC.

By G. E. Dobson, M.A., M.B.

The digastric muscle in man and in many other mammals consists, as is well known, of an anterior and a posterior portion, united by a tendon, or having their limits defined by an intermediate tendinous intersection. In most mammals, however, this tendinous intersection is either very feebly defined, or it is altogether absent. What, then, is its meaning when present, and on what does its relative development depend?

The distinct tendon which exists between the anterior and posterior bellies of the digastric in man and in other *Primates* might reasonably be supposed to be produced by tension from the aponeurotic loop, which attaches it to the greater cornu of the hyoid bone; but in many species of other orders a tendon or tendinous intersection is found where the connexion of this muscle with the hyoid bone is either very feeble, or distributed equally over the whole extent of its anterior belly, or obsolete; and in which, moreover, the direction of the intersection, where it traverses the substance of the muscle, is almost invariably oblique* and directed downwards, forwards, and inwards in a direction leading from and not towards the hyoid. The true significance of the tendinous intersection is to be found, as I shall endeavour to show, in the remarkable form assumed by the anterior belly of the muscle in certain species.

While engaged in the dissection of a specimen of that rare mammal, *Gymnura rafflesii*,† I was much struck by the peculiar form of the anterior belly of the digastric. About the middle of the muscle, at its narrowest part, it is traversed by an oblique tendinous intersection more marked internally, arising from the upper margin, which is continued inwards and slightly forwards from its lower and internal margin as a tendinous band across the mylo-hyoid muscle, to unite in front of the hyoid bone with the corresponding band from the opposite side. From the tendinous raphé thus formed, muscular fibres arise, which, extending forwards and inwards, cover the anterior three-fourths of the mylo-hyoid and part of the genio-hyoid muscles, and passing above the margins of the anterior bellies of the digastric muscles of opposite sides, are inserted with them and for some distance in front of them, into the rami of the mandible.

This horizontal muscular expansion, which takes its origin thus from the tendinous intersection and its median continuation, might also be described as a deep division of the anterior belly of the muscle, commencing at the tendinous intersection, and uniting with its fellow of the opposite side along the middle line between the jaws. Its posterior margin, the tendinous raphé above described, is concave, quite free from the hyoid bone, but attached to a fascial aponeurosis which passes backwards over it and the sterno-hyoid muscles.

On removing this muscular expansion, the mylo-hyoid muscles are found beneath, very thin, not extending half the distance between the hyoid bone and the symphysis menti.

In *Tupaia ellioti* the anterior bellies of the digastric also unite in the middle line between the jaws, but there is no separate superficial external lamina in direct continuation with the posterior belly as in *Gymnura rafflesii.* The intersecting tendon is narrower but more distinct, arises as in that species from the upper margin of the muscle, and is continued downwards, forwards, and inwards to unite with the corresponding tendon from the opposite side across the mylo-hyoid, precisely as in *G. rafflesii;* but, unlike its condition in that species, it is closely adherent to the muscles on which it lies, and is connected by a strong fibrous aponeurosis with the body of the hyoid bone, while the greater cornu receives also some tendinous fibres from the lower margin of the posterior belly. The united anterior bellies pass forwards, taking their origin from the tendinous raphé, and separating slightly near the symphysis, are inserted into the rami of the mandible, and by a fibrous aponeurosis into the symphyseal angle. The mylohyoid muscles, nearly wholly concealed by them, are, as in *G. rafflesii*, feebly developed, and do not extend more than half their length.

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* In some species it is nearly straight, but this does not depend on attachment to the greater cornu of the hyoid bone, as I purpose showing further on.

† I owe the opportunity which has been afforded me of examining the anatomy of this rare species to the kindness of Mr. W. T. Blanford, F.R.S., whom I have also to thank for many specimens of Oriental Insectivora, which have furnished me with much valuable material in working out my systematic and anatomical monograph of the *Insectivora.*

In *Chiromys madagascariensis*, the anterior bellies of the digastric muscles are united between the jaws,* but in other Lemuroids, as also in man, they are separate, each consisting of "two thick fleshy bellies with a long and strong median tendon."† In *Loris gracilis* I found a strongly marked oblique tendinous intersection (which has been described as a rudimentary tendon),"‡ connected by a fibrous aponeurosis with the greater cornu of the hyoid bone and also with the surface of the mylo-hyoid in front of it, so that here we have evidently a case of oblique tendinous intersection passing into tendon.

In *E. macrocephalus* and in *E. minor*, among the *Chiroptera*, I found the anterior bellies double, the deep lamina united and forming a horizontal muscular expansion extending backwards even behind the hyoid bone, but wholly unconnected with it, its posterior margin being connected laterally with the tendinous intersection and medially with a fascial aponeurosis loosely covering the sterno-hyoid muscles. It is especially interesting to note that here, where union of the muscles extends so far backwards, the tendinous intersection is vertical, or nearly so, and the direction of the fibres of the deep or internal lamina transverse, while those of the superficial external part spring from it at right angles to its direction and pass forwards to their insertion into the jaw at a short distance in front of their origin. Here, then, we have a vertical tendinous intersection unconnected with the hyoid bone. The mylo-hyoids are altogether absent, their places and part of their function being evidently taken by the united digastrics, which extend almost the whole length of the jaws; while their action on the hyoid is performed by the greatly developed genio-hyoid muscles.

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* Owen, "Trans. Zool. Soc.," v, p. 43.

† Murie and Mivart, "Trans. Zool. Soc.," vii, p. 18.

‡ By Van der Kolk and Vrolik, referred to by Murie and Mivart, *loc. cit.*

In the much larger but externally very similar species,* *Epomophorus franqueti*, the anterior bellies of the digastrics are single and not united between the rami of the madible, and the mylo-hyoids are present and well developed; the tendinous intersection described above is, nevertheless, visible, and though much less defined than in *E. minor*, occupies precisely the same relative position, and has the same vertical direction.

In *Herpestes nipalensis* the digastrics are very large and united between the jaws; the tendinous intersection is nearly vertical and is continued inwards to unite with the corresponding band from the opposite side slightly behind the hyoid bone. The raphé thus formed is connected with the fascia covering the sterno-hyoid muscles; and the deep surface of the united bellies is inseparably united along the middle line, with the very feebly-developed mylo-hyoids, which they conceal altogether.

In man, as an anomaly, the fibres of the two anterior bellies have been found blended with each other, and expanded into a muscular plane with considerable attachment to the jaws;† or the anterior belly has been found double, the second part uniting with its fellow in a median raphé below the chin, overlapping the mylo-hyoid muscle; ‡ or the tendon of intersection not unfrequently is continued from one side across to the other, forming a zone immediately above the hyoid bone, to the body of which it is tied down by fibrous tissue; from the upper surface of this the anterior bellies arise, either α distinct, or β, more rarely inseparable.§

It may be observed that this last described condition is precisely that of the same muscles in *Tupaia ellioti*, and is extremely interesting as evidently indicating reversion to a state of the muscle, probably once normal in ancient mammalian types, and which is now represented in man and most other mammals by a fascial layer only—the *supra-hyoid aponeurosis*—which, springing from the tendons of the digastric muscles of opposite sides, extends between their anterior bellies, covering the mylo-hyoid and part of the genio-hyoid muscles, as the similarly placed muscular expansion in *Gymnura* and in *Tapaia*.

In the species of the genus *Erinaceus* (the only other genus included with *Gymnura* in the family *Erinaceidæ*), a superficial oblique tendinous intersection occupies precisely the same position as in *Gymnura*, but is much less developed; it extends from the upper margin of the muscle (which is nearly of the same calibre from its origin to its insertion), appearing on both surfaces as an oblique tendinous inscription, and on reaching its lower margin is continued inwards into a fascial expansion extending between the anterior bellies of the muscles of opposite sides, covering the mylo-hyoid muscle, but no muscular fibres arise from it, as in *Gymnura.* In *Centetes ecaudatus* and *Hemicentetes madagascariensis*, in *Pteropus edulis* and *medius*, and probably in all the species of that genus, in *Epomophorus franqueti* (referred to above), in *Megaderma lyra*, in *Phoca communis*, and in *Cavia aperea*, for instance, though the fascial expansion may be either absent or feebly marked, the transverse tendinous inscription is traceable, although its presence in some, as in *Centetes ecaudatus*, is indicated only by a faint superficial oblique line surrounding the muscle in the usual position.* In these species, in which the anterior bellies of the digastrics are not expanded and united between the jaws, the mylo-hyoid muscles are well developed.

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* All the species of this genus agree very closely in certain external characters. (See "Catal. Chiropt. Brit. Mus.," p. 5.)

† Fleischmann, quoted by McWhinnie, "Lond. Med. Gaz.," xxxvii, p. 186.

‡ Wood, quoted by Macalister, "Trans. Roy. Irish Acad.," xxv, p. 33

§ Macalister, *loc. cit.*

The peculiar development of the anterior bellies of the digastric muscles in the species referred to above, and the relations between it and the tendinous intersection, demonstrate that whatever form this intersection may assume, whether that of a rounded tendon, tendinous band traversing the substance of the muscle, or feeble superficial tendinous inscription, it has evidently been originally developed in ancestral forms in the same manner, namely, as the point of attachment of a tendinous raphé extending inwards from the digastrics of opposite sides, and giving a fixed point from which the greatly expanded internal laminæ of their anterior bellies take their origin. In most species of mammals the anterior bellies are no longer united between the jaws, but the presence in many of a transverse tendinous intersection or inscription still indicates their original connexion.

While it appears evident that the original form and relations of the tendinous intersection of the digastric, if not in all mammals, at least in all those now showing a trace of tendinous inscription in that muscle, were such as we still find in *Gymnura rafflesii* and *Epomophorus minor*, its modified form or apparent total absence in most species remains to be accounted for.

The leading modifications of the muscle, including what I consider its primary form, may be arranged as follows :—

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* Professor Humphry thus describes it in *Phoca communis* and in *Cavia aperea*:— "Near its middle it presented in the seal a superficial transverse tendinous division which is probably the representative of the more distinct tendinous division in man :" in the latter species, "where the muscle passes further forwards nearer to the symphisis, the tendinous division is still more marked, involving the greater number of the fibres, yet the muscle has nearly a straight course from its origin to its insertion."—"Journ. Anat. Phys.," ii, p. 320.

A. With the anterior bellies united across the space between the rami of the mandible, the mylo-hyoid muscles feeble or absent.

a. Anterior belly double. Ex., *Gymnura.*

b. Anterior belly single. Ex., *Tapaia.*

B. With the anterior bellies separate, scarcely or not exceeding the posterior in calibre.

c. Tendinous intersection distinct. Ex., *Homo.*

d. Tendinous intersection rudimentary. Ex., *Erinaceus.*

e. Tendinous intersection absent. Ex., *Canis.*

And with respect to its attachments to the hyoid bone :—

C. Connected by ligament or by tendinous fibres with the hyoid bone. Ex., *Homo, Tapaia.*

D. Unconnected. Ex., *Canis, Gymnura.*

Where the digastric is directly connected by ligament with the greater cornu of the hyoid bone, as in man, other *Primates,* and the *Rodentia,* tension on the middle of the muscular mass would tend to the disappearance of the muscular fibres in the part directly acted upon, and so the tendinous intersection would alone remain forming a tendon ;* where, on the other hand, as in the dog and most other mammals, there is no such connexion, or the connexion is by fascial aponeurosis equally distributed between the sides of the anterior bellies of the muscles and the hyoid bone, as in *Erinaceus,* the character of the digastric would be mainly muscular throughout. Now, the special development of the central tendon, or its absence, appears to me to be directly related to the attitude of the head of the animal with respect to its body when engaged in swallowing its food. In the *Primates,* in most of the *Rodentia,* and in the arboreal *Insectivora,* the food is swallowed while the body is in the erect or semi-erect posture, and the head being bent forwards, the cavity of the mouth is at right angles with the œsophagus.† In this position the mylo-hyoid and genio-hyoid muscles are relaxed, and cannot act efficiently in drawing the hyoid bone upwards and forwards, so as to allow the masticated mass of food to pass into the œsophagus ; this duty, therefore, partly devolves on the digastric muscles, and the strain on their central parts, as explained above, leads to the disappearance of muscular fibre in the neighbourhood of the tendinous insertion, which accordingly becomes a tendon uniting two fleshy bellies. On the other hand, in most of the Mammalia, the usual attitude is prone, and the cavity of the mouth,

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[*] The intermediate condition is well seen in *Loris gracilis* and in *Tupaia ellioti,* as described above.

[†] The attitude of the head with respect to the body is of course mainly connected with the position of the foramen magnum, and the latter with the development of the brain.

when the food is being swallowed, is in a line with the œsophagus, or nearly so; in such a position the mylo-hyoid and genio-hyoid muscles can act effectively in elevating and drawing the hyoid bone forwards, and deglutition is effected without the aid of the digastric muscles, which are accordingly simple and unconnected with the hyoid, as in the dog;* or, if intersected, the tendinous band is either the origin of a raphé continued inwards, as described in *Gymnura* and *Epomophorus* (which may be, as in these genera, wholly unconnected with the hyoid), or the rudiment of such in an ancestral form.

(*Proceedings of Royal Society, March*, 1881.)

GASEOUS FUEL.

An article on "Gaseous Fuel" is contained in the *Building News* for September 2nd, of which the following abstract will not be without interest to our readers:—We have been so long accustomed to regard coal-gas as merely an illuminant, that it requires some effort to familiarise ourselves with the opinion which is daily gaining ground, that gas, suitably prepared and consumed in furnaces and stoves of proper construction, is among the best and cheapest kinds of fuel. One of the foremost and ablest advocates of the employment of gaseous fuel is Dr. Siemens, whose name is justly honoured by all students of science as the inventor of the regenerative furnace, and the pioneer of the employment of electricity for illuminating purposes. Dr. Siemens has recently urged the preparation of two kinds of coal-gas which he proposes should be distributed in separate mains, and be each of them specially adapted for the particular use to which it is to be applied. The gas given off from the retorts at the beginning and end of the process of gas-manufacture is far less rich in illuminating qualities than the gas expelled during the other part of the distillation, and the Dr. has pointed out that by collecting the gases evolved at the commencement and close of the operation and separating them from the remainder of the gas, it would be easy to obtain from, say, one ton of coal, one-third of illuminating-gas of high quality, or about 3,520 cubic feet, and two-thirds heating-gas, 7,040 cubic feet. It is worthy of notice that even the very high qualities of gas do not actually contain more than 6½ per cent. of illuminating constituents. In ordinary gas, such as that supplied in London, in each 100 cubic feet there are only four which actually yield light; the remaining 96 cubic feet are chiefly heating-gases, which burn with a colourless flame.

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* The difficulty experienced by a dog in swallowing when the head is bent forwards s well known to every one who has seen one attempting to swallow even a moderate sized morsel when seated erect in the familiar attitude known as "begging."

But when cooking and heating by gas, and the employment of gaseous fuel for manufacturing purposes, comes to be a little better understood, we very much doubt whether even the cheaper form of coal-gas, prepared as at present, and which we have assumed might be sold at *1s.* per thousand cubic feet, will ever become the fuel of the future. Heating-gas of very good quality, and in every way well adapted for domestic and manufacturing purposes, can be obtained at an infinitely less cost, and with a far cheaper description of plant than the gas which is now distilled from coal in retorts. To this cheaper gas the term "water-gas," has been somewhat improperly applied, and such gaseous fuel as this can be prepared on a large scale at little more than *2d.* per thousand cubic feet, with a fair margin of profit. Concerning the manufacture of water-gas, we need say no more here than that there are numerous plans, all more or less efficacious, for decomposing water into its two gaseous elements, hydrogen and oxygen. By the best of the contrivances which are employed for this purpose, it becomes possible to effect the separation of these gases, and to cause the oxygen at the moment of its liberation to combine with a volume of carbon, producing the best form of gaseous fuel obtainable from coal—to wit, carbonic oxide gas. In the ingenious apparatus which has been patented for the manufacture of this gas by the Dowson Economic Gas Company, water contained in a small boiler is converted into steam, and this steam is superheated in iron tubes; a jet of the high-temperature steam thus obtained is then passed into a furnace containining a deep layer of anthracite coal. The steam acting on the principle of the injector, is made to carry with it an adequate supply of atmospheric air, and the red-hot coal at once decomposes it into its gaseous elements—a very copious evolution of gas suitable for heating purposes is thus effected—and the gas may be purified by passing it through a layer of spongy oxide of iron. The yield of gas is in the ratio of 1,000 cubic feet to each 12lb. of coal added to the furnace, and 180,000 cubic feet can be readily obtained from one ton of anthracite coal. This gas has a calorific power equal to about one-third that of coal gas, so that, in round numbers, we may assume that each ton of coal will yield, by this treatment, an amount of gaseous fuel equivalent to that obtained from five tons of coal carbonised on the present system. But gas made by the decomposition of steam has no tar, no ammonia, and cannot possibly burn with a smoky flame indeed, there can be no deposition of soot, even when a cold metallic surface is exposed to the flame. Moreover, the foul-smelling hydro-carbons which cause the disagreeable smell in ordinary coal-gas, and which have led to many difficulties in using gas for cooking purposes, are entirely absent in the water-gas. It will be quite possible for a few families living in adjacent houses to combine and to obtain a supply of this economic gas laid on to their houses in the same way as coal-gas now is, and this new gas can then be employed in the kitchen, the laundry, the bath-room, and the conservatory, and the present use of coal as a fuel may be entirely abandoned. We are informed, indeed, that Lord Sudely has adopted the gas for all these purposes with complete success. We have still to mention that another important feature connected with this gas is the facility with which it may be carburetted or impregnated with illuminating constituents. This is effected by passing it through a vessel charged with gasoline. The vapour of the gasoline is absorbed by the gas, which becomes thereby so much enriched as to yield a high standard illuminant, superior in fact to London gas. We should remember, in conclusion, the immense importance which the possession of such a gas implies when we require power for domestic or manufacturing purposes. In a gas-engine of the "Otto" type, made by the Messrs. Crossley, this water-gas can be used in the same way as coal-gas now is, and the cost of each horse power is proportionately decreased. The actual cost of working, on an extended trial, with a 3½ horse-power effective engine, has proved that one-horse power (indicated) per hour is obtained with a consumption of gas derived from 1·4lb. of anthracite coal. When we contrast this result with the working of the largest and best steam-engines, using 2lb. of steam-coal per horse-power per hour, the gas-engine has a large balance in its favour; but when we remember that with small steam-engines the common consumption of coal varies from 5lb. to 6lb. of coal per horse-power per hour, the advantage in favour of the gas-engine and the new gas is too great to be long overlooked by those to whom cheap power is a desideratum.

JAUNDICE.

At the recent meeting of the British Medical Association, Dr. Lauder Brunton opened a discussion on jaundice, and said he should take up one or two points which he thought were especially calculated to advance their knowledge of the disease; but, in addition to these, he must also go over some things that were already well known to them, in order to render their advance afterwards more certain. They were pretty well agreed that the cause of jaundice was a pigment circulating in the blood—the bile-pigment or bilirubin. But the question arose: where was it formed? Was it always formed in the liver, or was it sometimes formed in the blood? If it were always formed in the liver, then every case of jaundice was hepatogenous. But, if it were sometimes formed in the blood and tissues generally, and not in the liver, then they might have exceptional cases of hæmatogenous jaundice. Jaundice here arose from absorption of bile into the blood, and this absorption might have two causes. It arose from a difference of pressure between the blood in the vessels and the bile in the bile-capillaries; and this difference might be due either to increased pressure in the bile-capillaries, or to diminished pressure in the blood-capillaries. Whenever they altered the normal relation of the pressure between the bile and the blood, either by increasing the pressure of the bile or diminishing that of the blood, they must get the bile passing into the blood. The two sets of capillaries were very close to one another, being separated merely by these limiting cells, and thus the passage from the one to the other was very easy. When the mucous membrane of the duodenum became swollen by catarrh, the opening of the gall-duct was liable to be closed up. The discharge of bile may also be prevented by occlusion of the gall-duct by a polypus, by gall-stones, by means of a worm, pressure of fæces upon the intestines, &c. Then, the second cause of jaundice depending upon the liver was the lessened pressure of blood in its vessels. This increased the pressure of bile in the gall-duct, and, first of all perhaps, in the lower part of the duct, but then extending backwards into the bile-capillaries, and into the very small gall-ducts into which these entered. When the pressure of the bile in the gall-ducts increased, the blood vessels were in close relation to the ducts; absorption might take place with very considerable rapidity, and with much greater rapidity, in fact, than many men had any idea of. By lessening the supply of blood through the vessels, the bile which was under its normal pressure would tend to go back into the blood-vessels and reabsorption would occur, just as it did by increasing the pressure of the bile in the capillaries. This was probably the cause of the jaundice which took place from mental emotions, as, for example, from fear or from excitement. The liver had a power of regulating the flow of blood, not merely through itself, but the rest of the abdominal viscera, as the stomach and intestines. An immense amount of blood flowed to the intestines. The vaso-motor centre of the fourth ventricle regulated this; and, if this were destroyed, as much blood could pass into an animal as it had before raising the pressure up to the normal—so that the amount of blood which the intestines held was really equal to the whole blood in the body, if the tension of the vessels were destroyed. The liver had two functions. It did not merely form bile, it re-excreted bile which had already been formed. After being formed in the liver, the bile was poured out, particularly through the duct into the duodenum, was re-absorbed through the duodenum and upper part of the small intestine, returned to the liver, and again re-excreted. So that bile-formation was a double function; and in this way many poisons might remain in the portal circulation without getting into the general circulation. It was when they got into the general circulation that they did the mischief. The bile might thus be formed in considerable quantities without ever getting into the general circulation. But if it were formed in too great quantity, as after a series of heavy dinners, for example, and luxurious living, the liver was no longer able to secrete all the bile, and it was carried to the other parts of the body with the symptoms they call biliousness. Then, in regard to the question of hæmoglobin being oxidised into bilirubin, the question he had wished to bring out was, not the actual question of the formation of the bile colouring matter from the hæmoglobin, as they were all agreed on that, but of where it was formed, whether in the tissues generally or only in the liver; and the evidence seemed rather to point to its being oxidised in the liver only, and not in the tissues generally; that the hæmoglobin was not oxidised into the bile colouring matter in the muscles or other organs, but only in the liver, and thence was carried to the other parts of the body, causing jaundice.

(*Abstract from "British Medical Journal.*)

THE BRITISH ASSOCIATION.

THE Jubilee Meeting of the British Association was opened in York on August the 31st, SIR JOHN LUBBOCK, Bart., F.R.S., &c., being President.

The President delivered a very eloquent and able address, in the course of which he considered the principal scientific results of the last half-century, embracing the progress in biology, the science of embryology, vegetable physiology, anthropology, geology, palæontology, geographical discovery, volcanoes, glaciers, and coral islands the progress in astronomy, spectrum analysis, light and colour; the applications of electricity, economic science, education, and agriculture.

In conclusion, he said: I fear I ought to apologise to you for keeping you so long, but still more strongly do I wish to express my regret that there are almost innumerable researches of great interest and importance which fall within the last fifty years (many even among those with which our Association has been connected) to which I have found it impossible to refer. Such, for instance, are in biology alone, Owen's memorable report on the homologies of the vertebrate skeleton, Carpenter's laborious researches on the microscopic structure of shells, the reports on marine zoology by Allman, Forbes, Jeffreys, Spence Bate, Norman, and others; on Kent's Cavern by Pengelly, those by Duncan on corals; Woodward on crustacea Carruthers, Williamson, and others on fossil botany, and many more. Indeed, no one who has not had occasion to study the progress of science throughout its various departments can have any idea how enormous—how unprecedented—the advance has been.

Though it is difficult, indeed impossible, to measure exactly the extent of the influence exercised by this Association, no one can doubt that it has been very considerable. For my own part, I must acknowledge with gratitude how much the interest of my life has been enhanced by the stimulus of our meetings, by the lectures and memoirs to which I have had the advantage of listening, and, above all, by the many friendships which I owe to this Association.

Summing up the principal results which have been attained in the last half-century, we may mention (over and above the accumulation of facts) the theory of evolution, the antiquity of man, and the far greater antiquity of the world itself; the correlation of physical forces and the conservation of energy; spectrum analysis and its application to celestial physics; the higher algebra and the modern geometry; lastly, the innumerable applications of science to practical life—as, for instance, in photography, the locomotive engine, the electric telegraph, the spectroscope, and, most recently, the electric light and the telephone.

To science, again, we owe the idea of progress. The ancients, says Bagehot, "had no conception of progress; they did not so much as reject the idea; they did not even entertain it." It is not, I now think, going too far to say that the true test of the civilisation of a nation must be measured by its progress in science. It is often said, however, that great and unexpected as the recent discoveries have been, there are certain ultimate problems which must for ever remain unsolved. For my part, I would prefer to abstain from laying down any such limitations. When Park asked the Arabs what became of the sun at night, and whether the sun was always the same, or new each day, they replied that such a question was childish, and entirely beyond the reach of human investigation. I have already mentioned that, even as late as 1842, so high an authority as Comte treated as obviously impossible and hopeless any attempt to determine the chemical composition of the heavenly bodies. Doubtless there are questions, the solution of which we do not, as yet, see our way even to attempt; nevertheless, the experience of the past warns us not to limit the possibilities of the future.

But however this may be, though the progress made has been so rapid, and though no similar period in the world's history has been nearly so prolific of great results, yet, on the other hand, the prospects of the future were never more encouraging. We must not, indeed, shut our eyes to the possibility of failure; the temptation to military ambition; the tendency to over interference by the State; the spirit of anarchy and socialism; these and other elements of danger may mar the fair prospects of the future. That they will succeed, however, in doing so, I cannot believe. I cannot but feel a confident hope that fifty years hence, when perhaps the city of York may renew its hospitable invitation, my successor in this chair—more competent, I trust, than I have been to do justice to so grand a theme—will have to record a series of discoveries even more unexpected and more brilliant than those which I have, I fear so imperfectly, attempted to bring before you this evening.

THE RISE AND PROGRESS OF PALÆONTOLOGY.

By Prof. Huxley, F.R.S.

Prof. Huxley, in concluding his discourse on this subject, summed up as follows:—

The whole fabric of palæontology is based upon two propositions: the first is that fossils are the remains of animals and plants, and the second is that the stratified rocks in which they are found are sedimentary deposits; and each of these propositions is founded upon the same axiom that like effects imply like causes. If there is any cause competent to produce a fossil stem or shell, or bone, except a living being, then palæontology has no foundation; if the stratification of the rocks is not the effect of such causes as at present produce stratification, we have no means of judging of the duration of past time or of the order in which the forms of life have succeeded one another. But if these two propositions are granted there is no escape, as it appears to me, from three very important conclusions. The first is that living matter has existed upon the earth for a vast length of time, certainly for millions of years. The second is that during this lapse of time the forms of living matter have undergone repeated changes, the effect of which has been that the animal and vegetable population at any one period of the earth's history contains species which did not exist at some antecedent period, and which ceased to exist at some subsequent period. The third is that in the case of many groups of mammals and some of reptiles, in which one type can be followed through a considerable extent of geological time the series of different forms by which the type is represented at successive intervals of this age is exactly such as it would be if they had been produced by the gradual modification of the earliest form of the series. These are facts of the history of the earth guaranteed by as good evidence as any facts in civil history.

Hitherto I have kept carefully clear of all the hypotheses to which men have at various times endeavoured to fit the facts of palæontology, or by which they have endeavoured to connect as many of their facts as they happened to be acquainted with. I do not think it would be a profitable employment of our time to discuss conceptions, which, doubtless, have had their justification, and even their use, but which are now obviously incompatible with the well-ascertained truths of palæontology. At present these truths leave only room for two hypotheses. The first is, that in the course of the history of the earth innumerable species of animals and plants have come into existence independently of one another innumerable times. This, of course, implies either that spontaneous generation on the most astounding scale, and of animals such as horses and elephants, has been going on as a natural process through all the time recorded by the fossiliferous rocks; or it necessitates the belief in innumerable acts of creation repeated innumerable times. The other hypothesis is that the successive species of animals and plants have arisen, the later by the gradual modification of the earlier. This is the hypothesis of evolution, and the palæontological discoveries of the last decade are so completely in accordance with the requirements of this hypothesis that if it had not existed the palæontologist would have had to invent it.

I have always had a certain horror of presuming to set a limit upon the possibilities of things. Therefore, I will not venture to say that it is impossible that the multitudinous species of animals and plants may have been produced separately one from the other by spontaneous generation, nor that it is impossible that they should have been independently originated by an endless succession of miraculous creative acts. But I must confess that both these hypotheses strike me as so astoundingly improbable, so devoid of a shred of either scientific or traditional support, that, even if there were no other evidence than that of palæontology in its favour, I should feel compelled to adopt the hypothesis of evolution. Happily, the future of palæontology is independent of all hypothetical considerations. Fifty years hence, whoever undertakes to record the progress of palæontology will note the present time as an epoch in which the law of succession of higher animals was determined by the observation of the palæontological facts. He will point out that just as Steno and as Cuvier were enabled from their knowledge of the empirical laws of co-existence of the parts of animals to conclude from a part of the whole, so the knowledge of the law of succession of forms enabled their predecessors to conclude from one or two terms of such a succession to the whole series, and thus divine the existence of forms of life, of which, perhaps, no trace remains, at epochs of inconceivable remoteness in the past.

ON THE DISCOVERIES OF THE PAST HALF-CENTURY RELATING TO ANIMAL MOTION.

By J. Burdon-Sanderson, M.D., LL.D., F.R.S.

(ABSTRACT.)

The two great branches of Biology with which we concern ourselves in this section, Animal Morphology and Physiology, are most intimately related to each other. This arises from their having one subject of study—the living animal organism. The difference between them lies in this, that whereas the studies of the anatomist lead him to fix his attention on the organism itself, to us physiologists it, and the organs of which it is made up, serve only as *vestigia*, by means of which we investigate the vital processes of which they are alike the causes and consequences.

To illustrate this, I will first ask you to imagine for a moment that you have before you one of those melancholy remainders of what was once an animal—to wit, a rabbit—which one sees exposed in the shops of poulterers. We have no hesitation in recognising that remainder in being in a certain sense a rabbit; but it is a very miserable vestige of what was a few days ago enjoying life in some wood or warren, or more likely on the sand-hills near Ostend. We may call it a rabbit if we like, but it is only a remainder—not the thing itself.

The anatomical preparation which I have in imagination placed before you, although it has lost its inside and its outside, its integument and its viscera, still retains the parts for which the rest existed. The final cause of an animal, whether human or other, is muscular action, because it is by means of its muscles that it maintains its external relations. It is by our muscles exclusively that we act on each other. The articulate sounds by which I am addressing you are but the results of complicated combinations of muscular contractions—and so are the scarcely appreciable changes in your countenances by which I am able to judge how much, or how little, what I am saying interests you.

Consequently the main problems of physiology relate to muscular action, or, as I have called it, animal motion. They may be divided into two, namely (1) in what does muscular action consist—that is, what is the process of which it is the effect or outcome? and (2) how are the motions of our bodies co-ordinated or regulated? It is unnecessary to occupy time in showing that, excluding those higher intellectual processes which, as they leave no traceable marks behind them, are beyond the reach of our methods of investigation, those two questions comprise all others concerning animal motion. I will, therefore, proceed at once to the first of them -that of the process of muscular contraction.

As regards the subject which is to first occupy our attention, that of the *process* of muscular contraction, J. R. Mayer occupies so leading a position that a large proportion of the researches which have been done since the new era, which he had so important a share in establishing, may be rightly considered as the working out of principles enunciated in his treatise on the relation between organic motion and exchange of material. The most important of these were, as expressed in his own words: (1) "That the chemical force contained in the ingested food and the inhaled oxygen is the source of the motion and heat which are the two products of animal life; and (2) that these products vary in amount with the chemical process which produces them." Whatever may be the claims of Mayer to be regarded as a great discoverer in physics, there can be no doubt that as a physiologist he deserves the highest place that we can give him, for at a time when the notion of the correlation of different modes of motion was as yet very unfamiliar to the physicist, he boldly applied it to the phenomena of animal life, and thus re-united physiology with natural philosophy, from which it had been rightly, because unavoidably, severed by the vitalists of an earlier period.

Let me sum up in as few words as possible how far what we have learnt by experiment justifies Mayer's anticipations, and how it falls short of or exceeds them. First of all, we are as certain as of any physical fact that the animal body in doing work does not use its own material—that, as Mayer says, the oil to his lamp of life is food; but in addition to this we know that he was unaware of, that what is used is not only the living protoplasm itself, but is a kind of material which widely differs from it in chemical properties. In what may be called commercial physiology—*i.e.*, in the literature of trade puffs—one still meets with the assumption that the material basis of muscular motion is nitrogenous; but by methods of proof it has been shown that the true "Oel in der Flomme des Lebans" is no proteid substance, but sugar, or sugar-producing material.

A fundamental fact is this, that although living tissues are constantly and freely supplied with oxygen, and are, in fact, constantly tearing it from the hæmoglobin which holds it, yet they themselves yield no oxygen to vacuum. In other words, the oxygen which living protoplasm seizes upon with such energy that the blood which flows by it is compelled to yield it up, becomes so entirely part of the living material itself that it cannot be separated even by the vacuum pump. It is in this way only that we can understand the seeming paradox that the oxygen, which is conveyed in abundance to every recess of our bodies by the blood-stream, is nowhere to be found. Notwithstanding that no oxidation-product is formed, it becomes latent in every bit of living protoplasm; stored up in quantity proportional to its potential acivity—*i.e.*, to the work, internal or external, it has to do.

Thus you see that the process of tissue respiration—in other words, the relation of living protoplasm to oxygen—is very different from what Mayer, who localised oxidation in the capillaries, believed it to be. And this difference has a good deal to do with the relation of

Process to Product in muscle. Let us now revert to the experiments on this subject which we are to take as an exemplification of the truth of Mayer's forecasts.

The living muscle of a frog is placed in a closed chamber, which is vacuous—*i.e.*, contains only aqueous vapour. The chamber is so arranged that the muscle can be made to contract as often as necessary. At the end of a certain period it is found that the chamber now contains carbonic acid gas in quantity corresponding to the number of contractions the muscle has performed. The water which it has also given off cannot of course be estimated. Where do these two products come from? The answer is plain. The muscle has been living all the time, for it has been doing work, and (as we shall see immediately) producing heat. What has it been living on? Evidently on stored material. If so, of what nature? If we look for the answer to the muscle, we shall find that it contains both proteid and sugar-producing material, but which is expended in contraction we are not informed. There is, however, a way out of the difficulty. We have seen that the only chemical products which are given off during contraction are carbonic acid gas and water. It is clear, therefore, that the material on which it feeds must be something which yields, when oxidised, these products, and these only. The materials which are stored in muscle are oxygen and sugar, or something resembling it in chemical composition.

And now we come to the last point I have to bring before you in connection with this part of my subject. I have assumed up to this moment that heat is always produced when a muscle does work. Most people will be ready to admit as evidence of this, the familiar fact that we warm ourselves by exertion. This is in reality no proof at all.

The proof is obtained when, a muscle being set to contract, it is observed that at each contraction it becomes warmer. In such an experiment, if the heat capacity of muscle is known, the weight of the particular muscle, and the increase of temperature, we have the quantity of heat produced.

If you determine these data in respect of a series of contractions, arranging the experiments so that the work done in each contraction is measured, and immediately thereupon reconverted into heat, the result gives you the total product of the oxidation process in heat.

I now proceed abruptly (for the time at our disposal does not admit of our spending it on transitions) to the consideration of the other great question concerning vital motion, namely, the question how the action of the muscles of an animal are so regulated and co-ordinated as to determine the combined movements, whether rhythmical or voluntary, or of the whole body.

Exactly forty-nine years ago Dr. Marshall Hall communicated to the Zoological Society of London the first account of his experiments on the reflex function of the spinal cord.

In the mind of Dr. Marshall Hall the word reflex had a very restricted meaning. The term " excito-motary function," which he also used, stood in his mind for a group of phenomena of which it was the sole characteristic that a sensory impression produced a motor response.

I propose, by way of conclusion, to attempt to illustrate the nature of reflex action in the larger sense, or, as I should prefer to call it, the Automatic Action of Centres, by a single example—that of the nervous mechanism by which the circulation is regulated.

The same year J. R. Mayer published his memorable essay, it was discovered by E. H. Weber, that in the vagus nerve, which springs from the medulla oblongata and proceeds therefrom to the heart, there exists channels of influence by which the medulla acts on that wonderful muscular mechanism. Almost at the same time with this, a series of discoveries were made relating to the circulation, which taken together, must be regarded as of equal importance with the original discovery of Harvey. First, it was found by Henle that the arterial blood-vessels by which blood is distributed to brain, nerve, muscle, gland, and other organs, are provided with muscular walls like those of the heart itself, by the contraction or dilation of which the supply is increased or diminished according to the requirements of the particular organ. Secondly, it was discovered simultaneously, but independently, by Brown-Séquard and Augustus Waller, that these arteries are connected by nervous channels of influence with the brain and spinal cord, just as the heart is. Thirdly, it was demonstrated by Bernard that what may be called the heart-managing channels spring from a small spot of grey substance in the medulla oblongata, which we now call the " heart centre"; and a little later by Schiff, that the artery-regulating channels spring from a similar head-central office, also situated in the medulla oblongata, but higher up, and from subordinate centres in the spinal cord.

When Brown-Séquard discovered the function of the motor nerves of the blood-vessels, he assumed that the same limitation was applicable to it as to that of muscular nerves in general. It was soon found, however, that this assumption was not true in all cases—that there were certain instances in which, when the vascular nerves were interfered with, dilatation of the blood-vessels, consequent on relaxation of their muscles, took place; and that, in fact, the nervous mechanism by which the circulation is regulated is a highly-complicated one, of which the best that we can say is that it is perfectly adapted to its purpose. For while every organ is supplied with muscular arteries, and every artery with vascular (vaso-motor) nerves, the influence which these transmit is here relaxing, there constricting, according (1) to the function which the organ is called upon to discharge; and (2) the degree of its activity at the time. At the same time, the whole mechanism is controlled by one and the same central office, the locality of which we can determine with exactitude by experiment on the living animal, notwithstanding that its structure affords no indication whatever of its fitness for the function it is destined to fulfil. To judge of the complicated nature of this function we need only consider that in no single organ of the body is the supply of blood required always the same. The brain is during one hour hard at work, during the next hour asleep; the muscles are at one moment in severe exercise, the next in complete repose; the liver, which before a meal is inactive, during the process of digestion is turgid with blood, and busily engaged in the chemical work which belongs to it. For all these vicissitudes the tract of grey substance which we call the *vascular centre* has to provide. Like a skilful steward of the animal household, it has, so to speak, to exercise perfect and unfailing foresight, in order that the nutritive material which serves as the oil of life for the maintenance of each vital process, may not be wanting. The fact that this wonderful function is localised in a particular bit of grey substance is what is meant by the expression, " automatic action of a centre."

But up to this point we have looked at the subject from one side only.

It is essential that there should be channels of information passing inwards, and that there should be channels of influence passing outwards. Now, what is the nature of these channels of information? Experiment has taught us not merely with reference to the regulation of the circulation, but with reference to all other automatic mechanisms, that they are as various in their adaptation as the outgoing channels of influence. Thus the vascular centre of the medulla oblongata is so cognisant of the chemical condition of the blood which flows through it, that if too much carbonic acid gas is contained in it, the centre acts on information of the fact, so as to increase the velocity of the blood-stream, and so promote the arterialisation of the blood. Still more strikingly is this adaptation seen in the arrangement by which the balance of pressure and resistance in the blood-vessels is regulated. The heart, that wonderful muscular machine by which the circulation is maintained, is connected with the centre, as if by two telegraph wires—one of which is a channel of influence, the other of information. By the latter, the engineer who has charge of that machine sends information to headquarters whenever the strain on his machine is excessive, the certain response to which is relaxation of the arteries and diminution of pressure. By the former, he is enabled to adapt its rate of working to the work it has to do.

If Dr. Whytt, instead of cutting off the head of his frog, had removed only its brain—*i.e.*, the organ of thought and consciousness—he would have been more astonished than he actually was at the result; for a frog so conditioned exhibits, as regards its bodily movements, as perfect adaptiveness as a normal frog. But very little careful observation is sufficient to show the difference. Being incapable of the simplest mental acts, this true animal automaton has no notion of requiring food or of seeking it, has no motive for moving from the place it happens to occupy, emits no utterance of pleasure or distress. Its life processes continue so long as material remains, and are regulated mechanically.

What does all this come to? Admitting that we are able to prove (1) that in the animal body Product is always proportional to Process, and (2), as I have endeavoured to show you in the second part of my discourse, that Descartes' dream of animal automatism has been realised, what have we learnt thereby? Is it true that the work of the last generation is worth more than that of preceding ones?

If I only desired to convince you that during the last half century there has been a greater accession of knowledge about the function of the living organism than during the previous one, I might arrange here in a small heap at one end of the table the physiological works of the Hunters, Spallanzani, Fontana, Thomas Young, Benjamin Brodie, Charles Bell, and others, and then proceed to cover the rest of it with the records of original research on physiological subjects since 1831, I should find that, even if I included only genuine work, I should have to heap my table up to the ceiling. But I apprehend this would not give us a true answer to our question. Although, etymologically, Science and Knowledge mean the same thing, their real meaning is different. By science we mean, first of all, that knowledge which enables us to sort the things known according to their true relations. On this ground we call Haller the father of physiology, because, regardless of existing theories, he brought together into a system all that was then known by observation or experiment as to the processes of the living body. But in the "Elementa Physiologiæ" we have rather that out of which science springs than science itself. Science can hardly be said to begin until we have by experiment acquired such a knowledge of the relation between events and their antecedents, between processes and their products, that in our own sphere we are able to forecast the operations of nature, even when they lie beyond the reach of direct observation. I would accordingly claim for physiology a place in the sisterhood of the sciences, not because so large a number of new facts have been brought to light, but because she has in her measure acquired that gift of prevision which has been long enjoyed by the higher branches of natural philosophy. In illustration of this, I have endeavoured to show you that every step of the laborious investigations undertaken during the last thirty years as to the process of nutrition, has been inspired by the previsions of J. R. Mayer, and that what we have learnt with so much labour by experiments on animals is but the realisation of conceptions which existed two hundred years ago in the mind of Descartes as to the mechanism of the nervous system. If I wanted another example, I might find it in the previsions of Dr. Thomas Young as to the mechanism of the circulation, which for thirty years were utterly disregraded, until, at the epoch to which I have so often adverted, they received their full justification from the experimental investigations of Ludwig.

But perhaps it will occur to some one that if physiology founds her claim to be regarded as a science on her power of anticipating the results of her own experiments, it is unnecessary to make experiments at all. Although this objection has been frequently heard lately from certain persons who call themselves philosophers, it is not very likely to be made seriously here. The answer is, that it is contrary to experience. Although we work in the certainty that every experimental result will come out in accordance with great principles (such as the principle that every plant or animal is both, as regards form and function, the outcome of its past and present conditions, and that in every vital process the same relations obtain between expenditure and product as hold outside of the organism), these principles do little more for us than indicate the direction in which we are to proceed. The history of science teaches us that a general principle is like a ripe seed, which may remain useless and inactive for an indefinite period, until the conditions favourable to its germination come into existence. Thus the conditions for which the theory of animal automatism of Descartes had to wait two centuries, were (1) the acquirement of an adequate knowledge of the structure of the animal organism, and (2) the development of the sciences of physics and chemistry; for at no earlier moment were these sciences competent to furnish either the knowledge or the methods necessary for its experimental realisation; and for a reason precisely similar, Young's theory of the circulation was disregarded for thirty years.

I trust that the examples I have placed before you to-day may have been sufficient to show that the investigators who are now working with such earnestness in all parts of the world for the advance of physiology, have before them a definite and well-understood purpose, that purpose being to acquire an exact knowledge of the chemical and physical processes of animal life, and of the self-acting machinery by which they are regulated for the general good of the organism. The more singly and straightforwardly we direct our efforts to these ends the sooner we shall attain to the still higher purpose—the effectual application of our knowledge for the increase of human happiness.

The Science of Physiology has already afforded her aid to the Art of Medicine in furnishing her with a vast store of knowledge obtained by the experimental investigation of the action of remedies and of the causes of disease. These investigations are now being carried on in all parts of the world with great diligence, so that we may confidently anticipate that during the next generation the progress of pathology will be as rapid as that of physiology has been in the past, and that as time goes on the practice of medicine will gradually come more and more under the influence of scientific knowledge. That this change is already in progress we have abundant evidence. We need make no effort to hasten the progress, for we may be quite sure that, as soon as science is competent to dictate, art will be ready to obey.

THE ARRESTATION OF INFUSORIAL LIFE.

By Prof. Tyndall.

Three years ago he brought with him to the Alps a number of flasks charged with animal and vegetable infusions. The flasks had been boiled from three to five minutes in London, and hermetically sealed during ebullition. On his arrival there this year 120 of those flasks lay upon the shelves in his library. Though eminently putrescible, the animal and vegetable juices had remained as sweet and clear as when they were prepared in London. Still, an expert taking up one of the flasks containing an infusion of beef or mutton would infallibly pronounce it to be charged with organisms. He would find it more or less turbid throughout, with massive flocculi moving heavily in the liquid. Exposure of the flask for a minute or two to lukewarm water would cause both turbidity and flocculi to disappear, and render the infusion as clear as the purest distilled water. The turbidity and flocculi were simply due to the coagulation of the liquid to a jelly. He took advantage of the clear weather this year to investigate the action of solar light on the development of life in these infusions, being prompted thereto by the interesting observations brought before the Royal Society by Dr. Downs and Mr. Blunt in 1877. The sealed ends of the flasks being broken off, they were infected in part by the water of an adjacent brook, and in part by an infusion well charged with organisms. Hung up in rows upon a board, half the flasks of each row were securely shaded from the sun, the other half being exposed to the light. In some cases, moreover, flasks were placed in a darkened room within the house, while their companions were exposed in the sunshine outside. The clear result of these experiments, of which a considerable number were made, is that, by some constituent or constituents of the solar radiation, an influence is exercised inimical to the development of the lowest infusoria. Twenty-four hours usually sufficed to cause the shaded flasks to pass from clearness to turbidity, while thrice this time left the exposed ones without sensible damage to their transparency. This result is not due to mere differences of temperature between the infusions. On many occasions the temperature of the exposed flasks was far more favourable to the development of life than that of the shaded ones. The energy which in the cases here referred to prevented putrefaction was energy in the radiant form. In no case had he found the flasks sterilised by insolation, for on removing the exposed ones from the open air to a warm kitchen they infallibly changed from clearness to turbidity. Four and twenty hours were in most cases sufficient to produce this change. Life is, therefore, prevented from developing itself in the infusions as long as they are exposed to the solar light, and the paralysis thus produced enables them to pass through the night time without alteration. It is, however, a suspension, not a destruction, of the germinal power, for, as before stated, when placed in a warm room life was invariably developed. Had he had the requisite materials he should have determined by means of coloured media or otherwise the particular constituents of the solar radiation which are concerned in this result. The rays, moreover, which thus interfere with life must be absorbed by the liquid or by its germinal matter. It would therefore be interesting to ascertain whether, after transmission through a layer of any infusion, the radiation still possessed the power of arresting the development of life in the same infusion.

VIVISECTION.

The subject of Vivisection has lately been prominently brought before the Medical Profession and the world generally. The cause of this agitation is the "Cruelty to Animals Act, 1876," and its working. According to the Act, a person shall not perform, or take part in performing, on a living animal, any experiment calculated to give pain, except subject to certain restrictions. "Pain" may arise from cutting or vivisection proper, also from physiological, pathological, and pharmacological experiments. Such experiments the Act prohibits. On the passing of the Act, assurance was given that it was not the intention of the Legislature to prevent altogether scientific research by means of experiments upon animals, and facility would be given to men, fully qualified to carry on researches, to obtain licenses. But this has not proved to be the case, for three most distinguished and able men have recently been refused licenses.

Prof. Fraser, in his address delivered at the opening of the section on Materia Medica and Pharmacology, at the International Medical Congress, said: The passing of the Act was largely due to compromise; the subsequent history of the operations of the Act proves that in place of appeasing clamour, this compromise has served as a strong incentive to its continuance. Investigators, to whom the Home Office has afforded the necessary licenses for performing experiments, have been assailed with unbridled invective, and influence is being brought to bear upon the Secretary of State to cause him to interpret the Act as one for the entire suppression of experiments on animals. How effectively this influence has operated, or how hazardous it is to place the progress of a science entirely at the mercy of a State official, utterly ignorant of its aims and triumphs, is now being exemplified. In several instances in which the objects were of the highest interest, and in which the importance of the results could not be predicted, the Government has constituted itself the supreme arbiter of science, and has ventured to decide that certain experiments were not required, and should not be performed. I do not make this statement unadvisedly. The instances are within my own knowledge, and in one of them I have the best reasons for knowing the facts, as only the other day I experienced the mortification of being refused a license. In this case, permission was requested for performing a few experiments on rabbits and frogs with a reputed poison, used by the natives of Borneo to anoint their arrows. If this be an active substance, it is impossible to predict what advantages might be gained from its use in the treatment of disease; but, apart from this, it is surely important to discover in the interests of travellers whether it really possesses toxic properties, and if it do possess such properties, what are their characteristics, and what is the best method of counteracting its effects? The absurd position has now been assumed by the State that an operation implying merely such a wound as can be produced by a needle point is not justifiable, so long as it is performed for the purpose of acquiring knowledge, and in the hope of benefiting the human race.

To us the matter bears a most serious aspect. To us it is as clear as the light of day that the action of remedies cannot be ascertained otherwise than by experiments on the lower animals. If this method of research be denied to us, what means are we to adopt for increasing the resources of our art? How are the rich treasures, which the enterprise of travellers, and the never-ceasing discoveries of chemists, place at our disposal, to be applied, as hitherto they have in so many instances been most beneficially applied, to the treatment of disease? How are we to discover antidotes to the poisonous action of toxic agents? Experiments on man with substances regarding whose properties no knowledge exists will ever be repugnant to medical science; and on that account, as well because of their entire insufficiency, they cannot be adopted as substitutes for experiments on the lower animals.

Is, then, the progress of pharmacology to be brought to a termination, and the treatment of disease to lapse into the former irrationalism, so distasteful to present aspirations, which are anxiously striving to attain exactitude in the art of medicine?

So far as this country is concerned, this result must inevitably occur unless we obtain our knowledge entirely from other countries, or unless the freedom of research is again asserted among us.

I believe the latter alternative is not impossible to be attained. Much of the clamour that has been raised against experiments on animals is the outcome of erroneous information and sentimental prejudice, and many who are now taking part in this clamour would cease to do so were their erroneous impressions removed. Let them endeavour to appreciate the problems we have to solve, let them realise the incentives that urge us to increase our knowledge, let them consider that each advancement is a gain for humanity, and, in place of lending themselves to obstruction and obloquy, they will repay our exertions with commendation.

Mr. John Simon, C.B., &c., stated, in his address before the Section of Public Medicine of the late Congress, that: Last autumn Mr. Lister wished to do some experiments in extension of the particular branch of knowledge with which his name is indentified, and at a point which he considered of extreme importance in surgical pathology. He found he must either abandon his investigation or must conduct it in a foreign country; and in his zeal for science, he chose the latter course. In stating this fact in a letter, Mr. Lister added that "even with reference to small animals, the working of the Act is so vexatious as to be practically prohibitory of experiments by a private practitioner like myself, unless he chooses to incur the risk of trangressing the law." A second name is that of Professor Greenfield, who has so highly distinguished himself in developing, by means of experiments, the preventive medicine of splenic fever. Dr. Greenfield, in order to perform his inoculation-experiments, had, of course, to become a license-holder under the Act; and his experience of the hindrances which attach to that position is expressed in the following terms: "It is my deliberate conviction, as a result of my experience, that these hindrances and obstacles are so numerous and so great as to constitute a most serious bar to the investigation of disease, and even of such remedial measures as would, by common consent, be for the direct benefit of the animals experimented upon. When to this is added all the annoyance and approbium which are the lot of investigators, it is to be wondered at that anyone should submit to be licensed." Dr. Greenfield's experimental operations consisted only in inoculating the virus of animal diseases, and he says: "I have not been engaged in other investigations for the simple reason that, with the present restrictions and the difficulty of obtaining a license, I regard it as almost hopeless to attempt any useful work of the kind in this country."

Mr. Simon also said: As I feel sure that the Act must at no distant time be reconsidered by the Legislature, and as I also very strongly feel that, quite apart from any question of legal enactments, there is the question of moral right or wrong to be considered in the matter, I would beg you to allow me to make my own public confession of faith (from which, I dare say, yours will not much differ) in that extremely important matter of controversy.

I regret to have had to speak at so much length of the heavy cloud which at present hangs over the study of scientific medicine in England, and which, in my opinion, is likely to be of specially disastrous effect on the progress of preventive medicine. As a very old public servant in that cause, I should, indeed, grieve to see it brought to a standstill for want of the scientific nurture which, in truth, is its very basis of life; and, speaking publicly of the danger on this occasion, I have hoped that the occasion may give importance to what I say.

At the concluding general meeting of the International Medical Congress, on August 9th, the following resolution was carried:—"That this Congress records its conviction that experiments on living animals have proved of the utmost service to medicine in the past, and are indispensable to its future progress. That, accordingly, while strongly deprecating the infliction of unnecessary pain, it is of opinion, alike in the interests of man and of animals, that it is not desirable to restrict competent persons in the performance of such experiments."

In his address on unveiling the statue of Harvey, at Folkestone, on August 6th, Professor Owen, as reported in the *British Medical Journal*, said: Fortunately for Harvey and medical science, Lord Chancellor Bacon, a contemporary of the physiologist, had truer views of the methods of advancing knowledge than have been manifested by some of his successors on the bench of lower grade. Such clamour would have met with no encouragement in 1628 from the author of the *Novum Organum*. And this leads me to trespass a little longer on your attention, and to refer to the next great advance in the knowledge of the actions and properties of the circulating system.

The discovery in question, which, as conferring a power to cure disease, I am disposed to regard as second only to Harvey's, was that made by John Hunter, in 1780, of the property of the arterial capillaries to enlarge under what he figuratively termed the "stimulus of necessity."

Suppose, for example, a cardinal, a bishop, a learned judge, or an earl of the last century to have been afflicted with an aneurysm at the bend of the leg; groaning, with a tumour in the ham of the size of a child's head; such tumour pulsating, pressing on the surrounding tissues, the bones, gristles, and nerves; occasioning inflammation and absorption of those parts, accompanied by unintermitting agonising pain, only to be allayed by lethal doses of opium or other deadly narcotic, and threatening imminent dissolution by a bursting of the thinned and inflamed skin. Aneurysms are not extremely rare afflictions. Prior to Hunter's discovery, supplementing Harvey's, the ablest medical authorities could only have assured the noble, right reverend, and learned patients, that the ordinary surgical remedy, excision of the tumour, was, as a rule, fatal. True, about that date, an able surgeon of St. Bartholomew's Hospital, Mr. Pott, had suggested amputation of the thigh, which somewhat diminished the chances of a fatal result; and this was held to be a great advance in the treatment of the aneurysm in question, and was, as a rule, submitted to. In what frame of mind would the wretched sufferer have listened to a statement that, through knowledge acquired by vivisectional experiment, his agony would be relieved, his limb preserved, his malady cured! Our modern so-called "humanitarians" know not what they do, or say; nor care they, as it seems, what benefits to suffering humanity they would obstruct or prevent. They are unconscious of the mistaken ground selected for unfurling their flag of a superior sensibility, are dumb in regard to the much more extensive and fitting fields for active interposition in favour of the lower creation, and in defence of poor animals from tortures inflicted on them by men who have no aims beyond their own gratification and what they miscall "sport." To the slow sufferings of the wounded pheasant, escaping from the gunner and his dogs, dyeing with its trickling blood the verdure of the close covert in which its poor life ebbs painfully away—to this they seem indifferent. For the poor hare or rabbit which has had its jaw broken by an ill-aimed shot and escapes, they care not: they know nothing of the consequences of the healing of the wanton injury. The chisel-teeth have been violently and painfully put out of gear; their law of perpetual growth is no longer controlled by mutual apposition and attrition; the essential instruments for cropping food have been mutilated for man's pleasure, and slow death from starvation is the consequence. When a keeper comes by chance on the emaciated body of such dead and starved hare or rabbit, the curiosity of the tusk-like incisors is offered to an anatomical museum.

But even these inhumanities, inseparable from sport, are scarce comparable to the agonies of the prolonged chase, when fox or stag are ultimately torn by the howling four-footed fiends, hounded on by biped masters.

Do our humanitarians hold "annual meetings for the protection of animals from" tortures inflicted year by year, and by thousands of inflictors, for sport only? No! Their sensibilities are solaced at the expense of the blessings to humanity due to a Harvey and a Hunter: they feel no shame in deceiving the public by such unfounded and libellous assertions as that "the inhuman system of vivisection was not necessary for the purposes of science."—(Report of the annual meeting, etc., *Daily News*, June 27th.)

I must not tresspass on your time by the manifold evidences, known to my medical and physiological hearers, as justifying the terms in which I have referred to the denunciation of such skilled experimenters as the immortal subject of this day's inauguration.

I must restrict myself to the relation thereto of Hunter's discovery of the property of the capillary blood-vessels to enlarge, under conditions which has made the cure of aneurysm, in a great proportion of cases, sure and painless. John Hunter was not thinking of such result when, pursuing the Baconian method for the advancement of physiological science, he applied it to the elucidation of the singular phenomena of the annual growth and shedding of the antlers of deer.

He had the permission of a gracious Sovereign to make his vivisections on those denizens of Richmond Park. When Harvey had demonstrated that the arteries carried blood, and in one definite direction, such an operation as Hunter proceeded to perform became conceivable in relation to his aim, and by his skilful hands practicable, without affecting the health or life of the animal. Whatever benefit to suffering humanity has been derived from Hunter's experiment, the vivisections of Harvey guiding thereto must come in for their share of the gratitude of humanity.

So guided, the course of Hunter's physiological reasoning led him to put a ligature round the artery supplying the growing antler. The pulsations of the vessels of the formative velvet* ceased, and soon the antler began to cool. The buck was released and bounded away. About a week after this vivisection Hunter revisited the park. The animal was caught, and to the experimenter's surprise the vessels of the antler were again pulsating, the velvet had recovered its warmth, the growth was proceeding as usual. Hunter, thereupon, ordered the buck to be killed (scores are hunted and slain annually for venison). He injected the arterial system, thinking he might have been mistaken in the vessel he had tied. No! The canal of the carotid was obliterated. But sundry, and ordinarily minute branches sent off below, or on the heart's side of the ligature, had enlarged, and had carried the blood to other capillaries communicating with the carotid above the ligature, and the enlargement of these previously inconspicuous vessels had restored the supply to the cold antler, and reintegrated the power of growth. "And what scientific result," might ask a member of the Victoria Street Society, "could attend so detestable a practice*"—such "vivisectional pandering to curiosity?" † The result was a power of relieving an enormous amount of human suffering and untimely death.

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*The name given by the "keepers" to the finely villous soft covering of the growing antler conveying and protecting the vessels supplying the material of growth. This ended, the "velvet" dries, shrivels, and is rubbed off by the fully "attired" buck.

At Hunter's Hospital—St. George's—cases of popliteal aneurysm were not uncommon. The sufferers were usually coachmen of the rich, subject to the pressure of the hard margin of the box-seat on the vessels of the ham.

Now, Hunter, turning over in his mind the phenomena he had observed and caused in vivisecting the deer, thought thus: "Suppose, instead of amputating the man's limb, I were to cut down and tie the femoral artery. It might stop the flow of blood into the aneurysmal tumour long enough, at least, to allow the blood there to coagulate and form a natural plug; and, if the human capillaries should behave like the cervine's, the man's leg may become nourished independently of the popliteal channel." So Hunter said to his groaning patient, who had previously consented to the happily not performed amputation—and there was no anæsthetic then in use: "My good man, if you will let me make a small cut in your thigh, it is possible I may save your life and your limb." "God bless you, sir," said the sufferer; "do what you think best, so you put me soon out of this torment." Hunter explained to his assistant and the surrounding pupils the results which he hoped and believed would follow a repetition on his patient of the vivisectional experiment on the deer. No sooner was the strong current of blood checked by the ligature of the femoral artery than the tumour ceased to beat and began to diminish. The patient exclaimed, with joy, that the agony in the ham was gone. It is true the leg, like the antler, began to part with its vital warmth. "Don't apply any artificial heat; simply swathe the foot and leg in flannels," were the vivisectionist's directions. In twenty-four hours the natural warmth began to return; not so the pulsations of the tumour; this morbid mass went on decreasing. In a few weeks the coachman walked out of the hospital on both legs, cured of his aneurysm. Surgery became possessed of a new and beneficent power, for which it now had sure physiological grounds. Subsequent mechanical improvements have led to obliteration of the aneurysmal artery by pressure; and the comparatively trifling operation which Hunter substituted for the rarely successful amputation recommended by Pott is now no longer resorted to.

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* Report, in *Daily News*, *ut supra;* v. Such are the terms in which a dignitary of the "Church," whose history does not reveal sympathy for human torture and violent death in torments, permitted himself to allude to an indispensable instrument of advance in the healing art.

† *Ib.*, *ib.*, Secretary of the "Society for the Protection," etc.

Such are the results—and instances might be multiplied—of vivisectional experiment, yielding, besides the light thrown upon the physiological problem suggesting and requiring the experiment, unexpected guiding power to the truly humane men who devote themselves to the alleviation of the suffering of their fellow-creatures. And note that the "tender-hearted," who set no bounds to the abusive epithets by which they assail and endeavour to arrest such beneficent work, and howl down the inflictor of a slight wound on a single deer, have no remonstrances in favour of the hundreds of the dappled herds which undergo the terrors of the chase, the wounds of the stalker's bullet, and the cutting of the throat, to supply the appetite and please the palate of the gourmand. In view of the Society's Bill for the total Abolition of Vivisection, which was down for second reading in the House of Commons on July 13th,* I would remark: Suppose a Parliament of George II. had listened to a forbear of the honourable baronet in charge of that Bill, advocating the total abolition of vivisection in the terms quoted below; and that the House, without going the extreme length recommended, had decreed that "no experiment on a living animal should be legal without express permission of the Secretary of State for the Home Department." John Hunter, at a period when he was known to society only as a rising young surgeon, amusing himself with making an anatomical museum, finds himself compelled to go to Downing Street to obtain the requisite license to solve the physiological problem then monopolising his cogitations. We may suppose the following colloquy to ensue:—

Home Minister: "What is the object, Mr. Hunter, of your proposed experiment on the living deer?"

Vivisector: "I want to know how their horns grow."

H. M.: "And what do you propose to do to gratify that desire?"

Viv.: "For one thing, I propose to cut down upon the carotid artery, and tie it."

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* Report, etc., *Times* for June 28th. The fuller Report, in *Daily News* of June 27th, gives the terms of the adopted motion: "That vivisection is a scientific blunder and a moral offence, and ought to be totally abolished."

H. M.: "And what good do you expect to get by inflicting on an unfortunate animal that degree of pain?"

Viv.: I have nothing further in view, sir, than what I have stated."

H. M.: "And so you would pander to your curiosity in regard to the growth of its horns by subjecting a poor deer to your detestable operation. I can give no sanction to such inhuman vivisection, of which you are unable to foresee any scientific results in relation to your own professional purposes and practice."

The discomfited physiologist departs; and mankind continue to die of a tormenting malady, sometimes with, sometimes without, the added operation of amputation at the thigh.

Mr. Mayor and gentlemen, my time, as my fellow-labourers are pleased to recognise, is pretty well occupied, and in the present year more closely and pressingly than usual. It is only a worker who knows the value of time; and this has led me, in acceding to the request which has brought me before you, to ponder in what way and degree I might turn the occasion to most profit. To have made my discourse simply laudatory of its great subject; to have dilated on Harvey's experiments and observations in elucidation of the mysteries of generation, for example, resulting in an enunciation of a law now beginning to be accepted, that every living thing has come from the germ, which Harvey calls "egg" (*omne vivum ab ovo*), of an antecedent living thing,—such treatment would but have been an inferior reproduction of countless previous orations. Therefore it seemed to me to be not only germane to the memory of the great vivisector, but also a duty on whomsoever may strive to follow in his steps, especially with the threatened appeal to the Legislature to totally prohibit such experiments as those to which mankind are indebted for Harvey's and Hunter's great discoveries, to exemplify by such instances as the time permitted the way and degree in which vivisection imparts the power of diminishing and removing the sufferings of our fellow-men.

In conclusion, I beg, in the name of my fellow-labourers in the promotion of the sciences of healing who have availed themselves of the facilities of travelling from London to Folkestone afforded by the South-Eastern Railway Company, to express their grateful and respectful acknowledgments to the chairman and directors of that Company for the special train so kindly and liberally provided for the occasion.

At the Annual Meeting of the British Medical Association, on August 11th, Prof. HUMPHRY proposed the following resolution:—

"That this Association desires to express its deep sense of the importance of Vivisection to the advancement of Medical Science, and the belief that the further prohibition of it would be attended with serious injury to the community, by preventing investigations which are calculated to provide the better knowledge and the treatment of disease in animals as well as in men."

He said: Before venturing to propose this resolution, I thought long and seriously upon the subject. I mentioned it to a considerable number of the other members of the Association; and they all, every one to whom I spoke, agreed with me that, whereas there is so much of misrepresentation and exaggeration, to say the least of it, placed before the public on this subject, which is tending to bring the minds of many persons, and, I am sorry to say, of our legislators, to wrong opinions on this matter, it was the duty of us, as members of the Profession and of the Association, who know what is right, who know what is the real position of the matter, who know the real importance of vivisection to the advancement of our Profession and the welfare of the community—it was our duty in the interest, less, indeed, of our Profession than of the general welfare of the public, that we should speak out, and state what we think distinctly. Gentlemen, the first argument raised against vivisection is the question *Cui bono?*—that question which stops so many a good thing—what good has it done? What good can it do to medical science and medical practice? To one who surveys the progress of medical science from its beginning, this question seems to be scarcely possible for persons to ask. Why, the truth is, that almost every advance—I am speaking thoughtfully and carefully—almost every advance in our knowledge of the workings of the human body has been made through vivisection. Our knowledge of the movement of the blood, our knowledge of the mode of action of the heart, and of the other processes by which the circulation of the blood is effected, of the functions of the nervous system, of the functions of the brain, of the several parts of the brain, of the functions of the spinal cord, of the several parts of the spinal cord, of every nerve which passes from the brain and the spinal cord, of the influence of those nerves over every organ and structure of the body, over the heart, over the lungs, over the stomach, over the pulse, over the kidneys, over the bladder, over the skin, over the muscles, is almost entirely due to vivisection. The knowledge of the great processes of secretion, of the functions of nearly every gland, and of nearly every organ, is due almost entirely to vivisection. What has been the influence of this upon medical treatment? Almost all real great advance in medical treatment has been due to better medical knowledge, and that better medical knowledge is greatly due to the advancement of physiology. Take away the knowledge which we have received through vivisection, and conceive what a chaos would be our knowledge of the human body and our ideas of the treatment of the diseases of the human body! You can scarcely conceive to what we should be reduced. Every man—in the whole history of medicine—every man who has made real advances in the knowledge of the workings of the human body, has done it through vivisection. From Galen, and Vesalius, to Harvey, to Hunter, to Hope, and Brodie—for this, the most practical of modern surgeons, was a vivisector—every one of these men, and they are few among the many, has made his greatest discoveries through vivisection. And in our own day, the observations which have been made, and which have led to the better treatment of wounds (and conceive the importance of that), and the better methods of securing blood-vessels, have been due, as I know, in great measure, to vivisection. The man who first employed the carbolic ligature would never have ventured upon it on the human body, had he not first carefully tried it upon animals. And, with regard to that remarkable and most important discovery, which was detailed in the International Medical Congress, by Pasteur, and which I regard as one of the greatest discoveries in medicine, and one which, perhaps, heralds more good to animals, as well as to man, than any other in our time, it is due to experimentation upon animals, and could not possibly have been made without that; and the result of Pasteur's investigations, which are but of yesterday, is that thousands and tens of thousands of sheep in France are being subjected to that inoculating process which he, by experimentation upon animals, has proved to be efficacious to ward them from some of the most malignant diseases. Let the *cui bono* question never be put again; and, if it be, let every medical man at once be ready with a full and complete answer. Indeed, the advantages derived from experiments on dead matter in the chemist's laboratory might as well be questioned as those derived from experiments, which have, from time to time, been made upon the living animal in the laboratories of physiologists and pathologists. Another argument against vivisection is, that it hardens the heart and demoralises the men who do it, and the students who see it. Now, is this a fact? We are asked for facts as to the advantages of vivisection; let us ask for facts as to the disadvantages. Is this a fact? Are the men who are compelled to do or who do inflict pain upon others, men or animals, of harder hearts than the rest of mankind? Are the surgeons who are continually, day by day—in my early days especially—inflicting long-continued, severe, and horrible pains upon their fellow creatures—are they, and were they, of harder hearts than the rest of mankind? And does it produce any hardening effect upon students? To go a little further, the men who go out with their guns, and leave the partridges and the grouse dying upon the field—do we look upon them as men with hard hearts? The men who go out fishing, who perforate the writhing worm with a hook, who hook the fish and leave it to die on land—do we think of them as men with hard hearts? No, gentlemen, it is the motive that hardens the heart. The springs of charity may be poisoned by a bad motive. If you give a beggar sixpence to get rid of him, that hardens the heart; and if the springs of charity may be poisoned by ill-motive, may not the work of vivisection? Is not the work of vivisection hallowed by good motive? Gentlemen, I know something of vivisection. I know that it is practised, whenever it can be so practised, under anæsthesia. Now, this is not admitted; but it is a fact, I have never seen an animal tortured when that torture could be prevented. Anæsthetics are almost invariably used, unless there is some special reason against them. I wish this to go forth to the world; and I think the manner in which this is overlooked, or not stated, is too bad. Anæsthetics, I repeat, are always used when it is possible to use them, and experiments are not performed unless there is a real object for the performance. I know the men to do it, and I know that they are kind-hearted, upright, and honourable men. Let me take one whose name is held up to scorn as a vivisector, Michael Foster. A kinder, truer, better, nobler man does not exist amongst anti-vivisectionists—does not exist in the world, perhaps, than Michael Foster. There is not a man of my acquaintance to whom, in the hour of trial and in the hour of need, I would look for help with greater confidence, though it might be to his own inconvenience or detriment (and that is a test of good-heartedness), no man to whom I would sooner appeal than to him. There is no man who binds others to him by the simple kindness and unselfishness of his nature more than he. There is no man who would form a better president of a society for the prevention of cruelty to animals than he. This argument is one which has no foundation in fact.

It is an absolute necessity that vivisection shall be practised, just as it is necessary that dissection of the human body shall be done. If it be not done in a legitimate way, it will be done in some other way. Is it not, then, far better that what must be done should be done in a recognised manner, by Englishmen, supposing them to be less prone to inflict unnecessary suffering than foreigners? Here let me say that I do not make any imputation against foreigners, but remark that the instances of such inflictions are usually adduced from abroad; perhaps, because they, therefore, are not easy to disprove? Is it not better that it should be done in England under such reasonable regulations as may be found desirable? and English physiologists are as anxious as any other persons that all unnecessary suffering should be prevented. It is well that Englishmen should be compelled to go abroad, as is even now in some instances the case, for the purpose of prosecuting that method of research which they know to be essential to the advancement of their science? Vivisection must not be viewed from the side of sentiment only. It must be regarded as a matter upon which the welfare of mankind is eminently dependent.

The *British Medical Journal*, of August 27th, says:—"The time seems now to have arrived when the Medical Profession, as a whole, ought to make a firm stand against the arbitrary and eminently hurtful manner in which the Home Secretary interprets the recent Act on vivisection. He seems bent upon defeating the highest aims and aspirations of the few medical men who find it worth their while to seek the advancement of their Profession, even amidst the showers of personal scurrilities that are heaped upon them by "hysterical and hired" agitators, who do not scruple to exaggerate statements, and to invent false ones, to support their propositions. The timely warning of Virchow must not be lost sight of. His address to the International Medical Congress was a masterly exposition of what anatomy suffered in its progress from fetters of a different, yet progress-retarding, nature; and he showed how easy the retrograde step might be taken under the influence of sentimental legislation. It was no mere Cassandra-like warning that the great German pathologist proclaimed in his philosophical defence of the experimental method of investigation. Anatomists and pathologists alike may one day find their means of instruction and investigation trammelled and fettered, under the guiding sway of a hysterical sentimentality. When such eminently-qualified men as Professor Thomas R. Fraser, of Edinburgh, Dr. Lauder Brunton, and Professor Lister, are refused certificates for carrying on investigations which they declare to be of the highest value to medical science, then it is time that the Medical Profession should support them in their praiseworthy efforts to obtain that liberal interpretation of the obnoxious Act, which will admit of good work being done, even under difficulties. The International Medical Congress and the British Medical Association will not have failed of their purpose, if the resolutions in favour of the continuance of vivisection passed in the Materia Medica and Physiological Sections of the former, and—under the able guidance of Professor Humphry—in a general meeting of the latter, bring those in high places to a consideration of the thoroughly illiberal policy which they are carrying out towards medical men, and humanity at large. Surely the powerful voices of Simon and Humphry will be listened to, and redress given at once. If not, medical men must agitate and combine, until they obtain complete freedom to carry out their investigations in the spirit that animated Harvey, Hunter, and Claude Bernard.

The foregoing extracts are sufficient to set forth the claims which vivisection has for the further advancement of science generally. Dentistry has yet much to learn, and that by experiment only. Therefore, the whole Dental Profession ought to join in the demand for freedom in research.

THE DENTAL MANUFACTURING COMPANY, LIMITED.

ANNUAL GENERAL MEETING.

The Eighth Annual General Meeting of the Shareholders of this Company was held at the Registered Offices, 25, Broad Street, Golden Square, London, W., on Monday, August 29th, 1881, D. D. Hepburn, Esq., L.D.S.Eng., in the Chair.

Mr. Hepburn, in moving the adoption of the Report, said it would be seen that the business of the Company continued to increase; that during the year it had been found necessary to make additional room at the London Depôt, to meet the requirements of the rapidly increasing business. The important alterations made had given every facility for such, and a large portion of the expense attending those alterations having been debited to the year's accounts, the profit was somewhat less than it would otherwise have been; still they were able to declare the same dividend as on previous occasions. During the past year, the Board, after due consideration, had issued 300 Shares at par, giving those already holding Shares the first offer. He was glad to say these Shares were all taken up within 10 or 12 weeks. This fact he considered as the surest test they could have of the increasing confidence of the Profession in the Company and its management. He then referred to the successful starting of a Dental Journal by the Company, which he considered would be the means of advancing the Company, and bringing it more prominently before the Dental Profession in all parts of the world. In conclusion, he said that Dentists, as a body, were Conservative, and not given to change, but moved like all good things in nature, slowly; but they were awakening to the advantages of co-operation, and beginning to see that the "bogie of professional trading," which was trailed across their path, was being scared away, and that, after all, there was nothing *infra dig.* in having Shares in a Dental Company, any more than in a Coal, Iron, or Land Company.

The Chairman then moved the adoption of the Report, which recommended a dividend for the year ending June 30th, 1881, of 7 per cent. free of Income Tax, upon the amount of paid-up capital; that a deduction of 5 per cent. be made from Plant, 5 per cent. from Goodwill, and the balance of profit carried forward to the credit of next year's account.

Mr. CRAPPER seconded the adoption of the Report, and said that doubtless the Shareholders of this Company would be more satisfied with a 7 per cent. dividend, under the circumstances, than a larger one. It had been the constant endeavour of the Board to build up for the future rather than take away the life-blood of the Company with larger dividends. It had been necessary to expend considerable amounts in fixed capital for alterations and improvements to premises, and he thought those who had seen the improvements made at the London Depôt would admit the wisdom of that step. Not only were increased facilities given for doing a larger business, both at home and abroad, but having space, and such an exceptionally good light, enabled them to offer the rooms for Clinics during the International Medical Congress, which resulted in the attendance of several hundred Dentists to witness the operations of their professional brethren who kindly demonstrated on those days; and the advantage of being, as some Shareholders put it, on their own premises, was much appreciated by Shareholders from distant parts of the country.

Dr. WORMALD supported the adoption of the Report, and pointed out that the returns for the year were in excess of any previous year, and had it not been for the exceptional expenditure incurred, the profit would probably have been the largest yet made. He was pleased to be able to refer to the Company's satisfactory and sound condition; it was still young, and, he was glad to know, was daily receiving support from men who had hitherto held aloof. It was gratifying also to know that by perseverance in the one course, viz., to excel in their manufactures, they had received a "First Class" Award at the International Medical and Sanitary Exhibition, and as it was the first occasion upon which the Company had exhibited their Teeth, Instruments, and Appliances, this recognition by the Judges would be highly gratifying to Shareholders throughout the country, as it at once placed the Company in the first rank as Manufacturers.

Mr. J. SMITH TURNER considered the alterations to the London Premises most advisable, and was glad to find the Company moving onward in a sound and substantial manner; and after some remarks respecting the Company's Journal,

Mr. GEO. LYDDON said he hoped the desire expressed by the Chairman, "that some day the cash system might prevail in Dental as well as other businesses," would be speedily realised, though he did not think the deposit system, as adopted by some concerns, was practicable in Dentistry.

After some remarks from Mr. W. H. COFFIN and others, the Report was adopted unanimously.

Mr. J. S. TURNER then proposed the re-election of Mr. Geo. Gregson and Dr. Wormald, the retiring Directors, to seats on the Board. This was seconded by Mr. THOS. GODFREY, and carried.

Mr. CRAPPER proposed the re-election of Mr. J. W. Davidson as Auditor for the ensuing year, and said that although the work had considerably increased, and his thorough system of checking all items occupied a very considerable time each half-year, yet he thought Mr. Davidson would undertake the work for another year, at least, at the same rate as before. Dr. WORMALD seconded the resolution, which was carried.

Mr. W. H. COFFIN proposed a vote of thanks to the Directors for their services during the past year, and said the Shareholders were indebted to them for the able manner in which they had conducted the business of the Company. This was seconded by Mr. THOMAS READ, and carried unanimously.

Mr. CRAPPER then proposed a vote of confidence in the Manager, Mr. Brewster, and said that it gave him great pleasure to do so; the eulogiums passed upon their Manager by the Chairmen and others in past years were no less true to-day; he was still as anxious in the best interests of the Company, and his foresight and judgment in matters of vital importance were most valuable; his suggestions were always of a practical character, and highly valued by the Board. Mr. GEO. GREGSON entirely endorsed Mr. Crapper's remarks.

Mr. BREWSTER, in reply, thanked the Members present for their vote of confidence, and said it was especially gratifying to him, as coming from Members of the Board who knew more intimately the anxieties and responsibilities of his position. At the same time, he wished to say that a great deal of the success attending his efforts was due to the hearty co-operation of the other *employés* of the Company, from their Manager at Manchester, downwards; he had always found them willing to sacrifice their own time and convenience in the interests of the Company.

A vote of thanks to the Chairman for presiding closed the proceedings of the General Meeting.

The Members then attended an Extraordinary General Meeting to pass a resolution in conformity with the notice given. It was at first contemplated to hold the meetings in January, but on further consideration it was found that the audit could not be completed early enough in January to give the required notice of meeting.

Dr. WORMALD then proposed, "That the General Meeting be held in February instead of August in each year, and that Clause 43 of the Articles of Association referring to General Meetings be expunged."

This was seconded by Mr. GEO. LYDDON, and carried, after which the Meeting terminated.

NEW INVENTIONS.

DENTAL FORCEPS.

By C. J. WALLIS, L.D.S.Eng.

THESE forceps are illustrated at page 1 of our Advertisement Sheet, and Mr. Wallis writes:—The exact adaptation of the blades of forceps to the neck of the particular tooth for which they are intended, is so essential to the successful removal of the offending tooth, that any improvement in their design and manufacture is welcomed by the operator. Having tried all the best forceps with which I am acquainted, for the extraction of molar and bicuspid teeth, and found something wanting in them, I have designed forceps for these teeth, of which the illustrations are given as above. Although the apparent difference in design from some of those in use is comparatively small, the difference in practice is great, and several practitioners who have used them pronounce them more perfect than any others they have tried. The improvement is in the curve of the handles and the blades; the blades of the upper molar forceps are designed to slide up the tooth until a firm grip is obtained, or to grasp the tooth directly through the gum and soft alveolar process, as the necessities of the case may require; and the point of the buccal blade is lengthened and curved so as to pass between the two fangs, whilst the sides of the blade accurately fit and grasp the two roots, thus the risk of breaking up and leaving any portion of the tooth behind is considerably lessened. The handles are curved so as to enable the operator to use the forceps at any convenient angle.

The blades and their arms of the lower molar forceps are rounded and reduced in size, and are so opened out and curved that the operator can see with ease the exact position of the tooth, where, and how the forceps should be placed; the points of the blades are so lengthened and designed as to pass well between the fangs, whilst the sides of the blades accurately fit them.

The lower bicuspid forceps, No. 1, is remarkable for its general curves, which render it convenient to hold and easy of application to the tooth, whilst the blades easily and surely adapt themselves to the tooth or root.

The lower bicuspid forceps, No. 2, is peculiar to the other only from the pointed form of the blades, which render it specially adapted for the removal of badly decayed bicuspid roots.

IMPRESSION TRAY FOR PIVOT TEETH.

By Gilbert Walker, L.D.S.Eng.

The usefulness of this invention will be quite apparent from the directions here given. The illustrations will be found at page 3 of the Advertisement Sheet. Fill the tray with "Godiva," or other hard setting modelling composition, and press the pivot-pin E right through it. Warm the surface of the "Godiva" over a spirit lamp. Pass the pivot-pin (E, fig. 1) to the top of the pivot cavity in the root, and gently slide the tray up the pin sufficiently far to take a good impression. When hardened, place the set screw (F) close to the handle of the tray (G) and fix it. Withdraw the pivot-pin, which can only be done in the direction of A B, figs. 2 and 3, when the impression may be removed in the direction of C D, thus avoiding "drags" or shifting of the pivot. Replace the pivot-pin, which will be found to accurately retain the relative position of the pivot cavity with respect to the plain of the root surface, whilst the set screw F will unerringly adjust the depth of the pivot cavity.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

To the Editor of the Dental Record.

Sir,—Kindly allow me to correct an error in your report of the clinics at the offices of the Dental Manufacturing Company on the 6th inst., as it appears in the current number of the Dental Record. You say, "Dr. F. Comer fixed a *Bonwill* crown with amalgam," whereas it was a *Comer* crown, manufactured by Messrs. Lemale and Co., of 53, Haymarket, and *not* a "Bonwill" crown, which I attached by my own method to the roots of a right superior first bicuspid. The difference in the construction of the crowns, my method of attachment, and what I conceive to be the advantages of my method and crowns over those of Dr. Bonwill, were explained in an article upon the subject published in the *British Journal of Dental Science* of July 1st.

Yours truly,

Torquay, August 25th, 1881. FRANK COMER.

MEMO.—Referring to the operation, I have just received a letter from the patient for whom Dr. Field, of Detroit, attached a Richmond, and I the Comer crown above-mentioned, in which he says:—"The Comer crown answers admirably. It is as firm as any tooth I have, and the abscess (from the treatment you directed) has quite disappeared. The Richmond crown is not, at present, as firm as yours, the gum is inflamed, and is under professional treatment." I have not sufficient time at present to enumerate what I consider to be the advantages of my method over those of Drs. Bonwill and Richmond, but the above extract speaks for itself.—F.C.

To the Editor of the DENTAL RECORD.

SIR,—Will you allow me space to make known that having, in deference to the wishes of friends who do not see the Medical Journals, printed the addresses connected with Section XII. in pamphlet form, a copy may be had by any Member of the Congress desiring a souvenir of that event, by communicating his wish to

Yours very truly, EDWIN SAUNDERS.

13A, George Street, Hanover Square, W.

To the Editor of the DENTAL RECORD.

SIR,—In the *Dental Record* for this month (page 132, "Suggestions to Students") a remark is made affecting my pupil and self. My pupil was articled to me on June 29th last, and has not passed his preliminary examination, but intends to offer himself in April next. You state (or to this effect) that his three years' mechanical studies are not recognised until the date of passing the aforesaid preliminary. Now, I wish to know whether the passing of the preliminary *during* the three years mechanical study is not equivalent to passing it (the preliminary) previously? An adequate explanation will oblige

Yours truly,

Sheffield, September 10th. CHARLES STOKES.

Editorial.

APPRENTICESHIP AND THE PRELIMINARY.

THERE prevails in the profession a widespread misconception as to the time when the Dental Pupil is required to pass the Preliminary Examination. By some practitioners and pupils, it is thought that if the Preliminary Examination be passed at any time during the service of articles, or before commencing hospital studies, that will suffice. But such is not in accordance with the requirements of either the General Medical Council or of the Royal College of Surgeons of England. The regulations of the General Medical Council, and the curricula of the several licensing bodies, require of the Dental Student a certificate of having received instruction in Mechanical Dentistry during three years from a Registered Practitioner. That instruction, whether in the form of pupilage or otherwise, is, therefore, regarded as part of the required four years' Professional Education. Again, by reference to the Syllabus of the Professional Education required by the Royal College of Surgeons of England, which is to be found on page 133 of the previous number of the RECORD, it will be found that Clause 9 of those requirements deals with the question of Mechanical Dentistry; and that it is included in the subjects of Professional Education. If attention be now directed to the "*Note*" on page 133, it will also be found that all candidates who commenced their Professional Education on or after the 22nd of July, 1878, will have to produce a Certificate of having, prior to such commencement, passed a Preliminary Examination.

As we clearly stated last month in our "Suggestions to Students," it should be distinctly understood that the three years' instruction in Mechanical Dentistry, whether as pupilage or otherwise, is part of Professional Education. And before commencing his Professional Education, either by Apprenticeship or by Hospital Studies, the Pupil must first pass a Preliminary Examination; or, in other words, after passing that Examination, four years must be spent in the study of the subjects of the Curriculum, which includes three years instruction in Mechanical Dentistry.

These interpretations of the regulations in question are in accordance with not only their obvious meanings, but also with the opinions of the General Medical Registrar and the Secretary of the Royal College of Surgeons of England.

The regulations of the General Medical Council in regard to the Preliminary Examination and registration of Medical Students are the same for Dental Students. The first clause states that "No person shall be allowed to be registered as a Medical Student unless he shall have previously passed a Preliminary Examination in the subjects of General Education;" while Clause 9 requires that "The commencement of Professional Study recognised by any of the Qualifying Bodies shall not be reckoned as dating earlier than fifteen days before the date of Registration."

Having definitely pointed out the time when the Preliminary Examination should be passed; and what is required of the student, as regards Mechanical Dentistry, after passing that examination; also the regulations affecting the registration as a Dental Student, it behoves those who undertake the instruction of pupils to inform intending apprentices what is required of them. By a pupil passing a Preliminary Examination in General Education before he commences his articles, or even by so doing during the first year of a four years' apprenticeship, much annoyance, trouble, and time will be saved when he afterwards wishes to proceed to his other studies and to his examination.

GOSSIP.

THIRTY-NINE mummies, several of kings, have been discovered in a well or pit, not far from the edifice of the Deir-el-Bahari, in Egypt. The bricks of which the pit was formed were of conical shape, and stamped the titles of the high-priests of Amen-ra, thus used by the monarchs of the twenty-first dynasty. With the mummy of Amenhotep I. or Amenophis, were wreaths of flowers with their colour exquisitely preserved. These flowers are more than 3,000 years old, and it is supposed that their preservation is probably due to their having been buried in hot sand, a mode still in use in Palestine.

A WRITER in the *New York Sun* states that if the epileptic sufferer will carry with him a piece of common black silk, big enough to cover his face, and, whenever he feels the fits coming on, will cover his face with it, he will find it a sure cure. This recipe, he says, was given to my father by an old Frenchman, my mother having been subject to fits for many years. She never had one afterwards. When she felt one coming on she would place the silk over her face. I do not know the virtue of it, but do know from experience that it does the work.

A CIRCULAR brass seal, nearly 2 inches in diameter, has recently been found on Washcommon, the scene of the first battle of Newbury, September 20, 1643. It bears the device of a skeleton, with the surgeon's knife in the dexter hand, and an hour-glass on the sinister side; also the inscription "THE . SOCIETY . AND . LOYALTY . OF . CHYRVRGEONS . HALL . LONDON." It is supposed to have been used by the surgeons belonging to the Chirurgeon's Company of London attached to the Royal Army at Newbury, and to have been lost in the encounter.

M. GASTON TISSANDIER, the eminent French aëronaut, has constructed a small balloon about eleven feet long by four and a half feet in diameter, filled with pure hydrogen gas, and fitted with a double-bladed screw propeller, which is driven by a dynamo-electric motor, made by M. Trouvé, and weighing only eight ounces. The motor is actuated by the electric current from a Planté secondary battery, weighing three pounds, and drives the screw at the rate of six and a half turns per second.

THE College of Preceptors will hold Examinations in the subjects of the Preliminary Literary Examinations, required by the General Medical Council and other bodies by whom the College Certificates are recognised, in March and September in each year, beginning with March, 1882. Regulations respecting these Examinations may be obtained on application to the Secretary of the College of Preceptors, 42, Queen's Square, Bloomsbury, W.C.

IT should be noticed, states the *Chemist and Druggist*, that the practice of dental operations is not forbidden by the Dentists' Act, 1878. The notice, "Teeth Extracted," will not incur a penalty so long as no title is assumed which would lead the public to suppose that the person is registered. But if credit is given for such operations, the debtor might repudiate the debt, and the unregistered creditor would have no remedy against him.

IT is reported that an International Exhibition will take place at Shanghai in 1883, in imitation, more or less, of the Melbourne and Sydney displays. The organisers feel certain of its being a success, on account of the growing appreciation of the importance of the Chinese market by European and American manufacturers. We have not yet heard of any Dental Depôt being represented in the Exhibition.

The supposition that the different elements might be resolved into simple constituents, and even into a single substance, has long been a favourite speculation with chemists; but however probable that hypothesis might appear *à priori*, it must be acknowledged, according to Prof. Dewar, that the facts derived from the most powerful method of analytical investigation yet devised, give it but scant support.

By applying, with a fine hairbrush, a mixture of turpentine and sulphur boiled together, a brilliant black can, it is said, be produced on iron and steel. When the turpentine evaporates there remains on the metal a thin layer of sulphur, which unites closely with the iron when heated for a time over a spirit or gas-flame. This varnish protects the metal perfectly, and is quite durable.

At Speddock, near Dumfries, there is a very remarkable black Hamburg vine. It is about eighty years old, and nearly fills a vinery 60 feet long and 20 feet wide, with a high back wall. Last year the vine bore 600lb., and this year it has fully 700lb. of large conical black grapes of superb quality, each bunch being quite a model.

In his address in Obstetric Medicine, before the annual meeting of the British Medical Association, at Ryde, Dr. J. G. Sinclair Coghill said parturition may be physiological in design, but, in general results, the combined influences of civilised life have unquestionably rendered it largely pathological.

The Earnock Colliery, near Hamilton, North Britain, has been partially lighted by the Swan electric lamp, the success of the preliminary trial being such that a complete installation will doubtless be made immediately. Photographs of the mine have been taken by means of the light.

Both storms and the aurora borealis disturb the currents which are being conveyed along telegraphic cables; and recent experience seems to prove that the disturbing influence of storms chiefly affects short lines, while the longer lines are more liable to be affected by the northern lights.

The Great Prussian Gold Medal for Art and Science has recently been conferred by the Emperor of Germany upon Mr. George Matthey, F.R.S., of the well known firm of Johnson and Matthey, Hatton Garden, in recognition of his services in the interest of science.

A new genus of fossil fishes, from the Mountain limestone at Richmond, Yorkshire, has been described by Mr. James W. Davis, F.G.S., and denominated *Diodon-topsodus*. The teeth resemble those of the existing fish Diodon.

THAT the pressure of the atmosphere exercises a marked influence upon the escape of water from springs is a conclusion recently arrived at by Mr. Beldwin Latham, M.I.C.E.

SINCE the opening of the Electric Exhibition in Paris four fires have occurred. These severally originated from the high resistance of the conducting wires.

BY means of the gastroscope, can the electric light be conveyed into the stomach, and the interior of that viscus be viewed through the mouth.

THE President and Council of the Students' Society of the National Dental Hospital and College will hold a conversazione on Friday, the 14th inst.

THE total number of members of the British Medical Association is 9,202.

INTERCOMMUNICATIONS.

ANSWERS.

(2.) F. E.—Ulceration of the face may arise from decayed teeth, and is not uncommonly seen during primary dentition. When occurring under such conditions, it is regarded as an altered nutrition of the part through reflex or associated nervous action.—*Ed.*

(4.) J. T.—To recover old vulcanized rubber, the pieces are heated in contact with steam, when the sulphur is volatilised and the caoutchouc melts and is collected as a liquid, used in preparing waterproof covers. Though not a complete answer to the question, it is sufficiently relevant to send for insertion in the RECORD.—*C.N.*

(5.) ZERO.—When a thermometer has been subjected to a high temperature, the glass afterwards contracts very slowly, this contraction extending over many months. This accounts for the variation in registration when used for lower temperatures.—*Phys.*

QUESTION.

(6.) R. B.—I shall be glad if some of your readers would give a good formula for making and colouring Impression Composition similar to Stent's.

Communications.

Communications have been received from W. H. Coffin, London; Dr. Frank Comer, Torquay; G. W. Parkinson, London; Felix Weiss, London; John Laws, Weymouth; Chas. Stokes, Sheffield; Edwin Saunders, London; C. J. Wallis, Edinburgh; F. J. Van der Pant, Kingston; W. Hodgskin Hope, Wellingboro'; F. Henri Weiss, London; W. M. Adamson, Glasgow; George Torpey, London; Dr. Ditcham, Blackheath; Frank A. Huet, Manchester; H. Cecil Riches, Cardiff; C. N.; Phys.; &c.

Books, &c., Received.

"Dental Cosmos." "Journal of the British Dental Association." "Souvenir of Section XII. of the International Medical Congress," by Edwin Saunders, President. "British Journal of Dental Science." "The Times."

THE

DENTAL RECORD.

VOL. I. NOVEMBER 1, 1881. No. 5.

NECROSIS.

By WILLIAM HODGSKIN HOPE.

It is not my intention to enter into any discussion regarding the nature and treatment of this painful form of disease, but to refer briefly to the position occupied by the Dental Profession towards it. It may be a settled conviction in the minds of many, that Necrosis of the jaw is of more frequent occurrence now than it was in years gone by; and, later on, I may with propriety refer to the probable reason for it. For the present, I shall consider the more familiar forms met with by Dentists; and attention may with interest be directed to those cases which, if common discretion were exercised, could not possibly end in the disastrous consequences so often to be met with. Apart from the numerous causes to which Necrosis may be attributable, including periostitis, syphilis, phosphorus, mercury, &c., mechanical injuries seem at present to play no unimportant part; and these cases, with others which are allowed to develop into Necrosis, through absolute want of knowledge, or through carelessness, may claim our consideration very profitably. We cannot argue consistently that because Necrosis occurs constantly without any possible explanation being offered as to the cause, that, therefore, an increase of cases should not awaken any suspicion. To the contrary, I maintain that this circumstance should make inquiry all the more imperative.

Sequestration may occur after the most perfectly managed operation of tooth extraction, and there can be no doubt that it frequently does; but it is not of any serious nature, or, considering the vast number of extractions that take place, our operating rooms would be much more dreaded than they are at present. All operations, however, are not perfectly managed—far from it; consequently the results, frequently to be met with of late, of injuries of a very severe character, involving, if not the complete destruction of the alveolar portions of the jaws, still the loss of a great part, and sometimes the whole depth of the jaw, may be said to form a very substantial proof.

Since our profession received the esteemed protection by law, the generous public have discovered a noble army of gentlemen who are both self-reliant and anxious to operate upon them. The existence of these persons prior to the passing of the Act had never been heard of as at all connected with the Dental Profession. Far be it for me to suggest that the extraction of a tooth is such a difficult operation that years of constant practice are needed in order to qualify for the work; but we may expect it to be freely admitted on all hands that, without a proper knowledge of the anatomical construction of the jaws, and unless a full and careful estimate be held of all injuries possible during the operation, it is not inconsistent to expect numerous cases, the after effects of which, assume the most direful aspects. If it were fair, it would be possible to produce proofs of many operations (during the last two or three years particularly) conducted not only without any share of knowledge, but with a display of culpable negligence deserving the severest censure. These unhappy instances not only bring unbounded discredit upon the profession amongst a certain class of patients, but tend to show that if our profession is protected the public are not.

In addition to such cases showing mechanical violence, there are those in which symptoms already serious have been unquestionably aggravated by the mistaken advice of those gentlemen who have been consulted as *Dentists!* It is not now a matter of opinion, but of fact, that no object is attainable by allowing a tooth to remain in the mouth on account of inflammation or suppuration. One of our greatest authorities writes:—"There is not the smallest reason for believing that the removal of a tooth should be deferred because the tissues around it are in a state of acute inflammation or suppuration. If the tooth be the existing cause of the mischief, there is no excuse for delaying its extraction for a single moment, and the opinion to the contrary—held though it be by a number of medical men—is in no degree shared by Dentists; and, being based on no evidence whatever, must take rank in the category of popular errors." This popular error—let it be said with sorrow—is not only shared by many medical men, but by a large majority of our own profession, and is acted upon so well that exquisite suffering is insured to thousands of patients without any necessity whatsoever.

Cases, also, have come under my notice in which, judging by appearances, the operation must have been a most extraordinary one. Not having been present, it became not only an impossibility to say what class of instruments had been used, but under what newly discovered laws the operation had taken place, for in no legitimate way could such havoc have been made in the mouth. Surely simple justice demands that if a man undertakes such work he should understand a little about it, and, above all, know what harm may be done through culpable ignorance.

In conclusion, it may be observed, that the public cannot be guaranteed immunity from such cruel suffering until time shall have brought with it the accompanying knowledge, or the *Dental Register* shall have received the revising attention it deserves

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LUSUS NATURÆ.

By George Ward.

All Dental practitioners who have been some years in practice must have observed strange cases in the shedding of the first and second dentitions. The writer has seen many odd freaks of nature as regards single teeth, pairs, and sixes, yet he never saw but once where the two natural sets of teeth (temporary and permanent) were perfect in one mouth. Nor has he been fortunate in observing that most strange of all strange cases, viz., an entire absence of teeth in the jaws from birth ; in fact, a human being naturally destitute of teeth apart from decay or loss. That such cases have occurred, those who are curious in such matters will find it stated in the "Ephémérides des Curieux de la Nature," that a magistrate and a surgeon of Frederickstadt never had any other teeth than the twelve molars, and they were entirely without the incisors, canines, and bicuspids, for life. Fauchart also mentions the case of a child of from five to six years of age, who had only a few in front, the other teeth not having appeared. But what is most surprising is the fact of persons being totally destitute of teeth from birth. Several examples of this condition are given by various authors. For instance, Boxelli reports in his "Medical Centuries," the case of a woman who never had any teeth, yet lived to the age of sixty years. Also M. Baumes mentions the case of a French hussar who had never cut a single tooth. On the other hand, it sometimes happens that some of the temporary teeth are never cut, but only the permanent, as witnessed by an English Dentist in the case of a Russian nobleman's son, aged eleven, who was of a very weak constitution.

Now, by an inverted order of things, nature sometimes preserves the temporary teeth and withholds the permanent ones. There are many who carry their temporary teeth very late into life—in fact. never shed them. The temporary molars are the most frequent examples of this form of lusus naturæ. Then there are those peculiar cases, as, for instance, mentioned by one of the physicians of the hospital at Havre, of a father and daughter who had never cut the left permanent incisors of the lower jaw. The writer has, as patients, a mother and daughter, and that daughter's daughter, all of who have never cut their permanent upper laterals. Also another patient, a gentleman, aged forty-four, who cut, between the age of eighteen and twenty-two, six upper bicuspids, three each side; two in line, as usual, and the third behind, yet exactly between the two front bicuspids. Another case of a lad of 15½ years of age, who, when the writer saw his mouth, had four temporary and four permanent incisors, and four canines. Cases of not cutting the permanent canines are not uncommon. The writer has a skeleton jaw, in which the two lower wisdom teeth are lying perfectly parallel with the jaw, and with the crowns pressing against the second molars, and the fangs running into the back of the jaw. As before stated, the writer saw a case of the two sets of teeth, temporary and permanent, in the same mouth, that of a girl aged twenty-three. It is mentioned in the classics that the son of Mithridates had two perfect sets of teeth, while Hercules—if we are to credit the assertion—had three perfect sets. Perhaps we might be tempted to doubt these statements, and to consider them hypothetical or mythical, if Arnold had not reported, in a collection of observations published at Breslaw, in 1772, and dedicated to the celebrated Haller, that he had seen a child, aged fourteen, who had seventy-two teeth, all healthy, and well-placed in two rows, the incisors slightly irregular.

Now, from this excessive prodigality, we must not conclude that if we take away some teeth, others will take their place, for a third or fourth time. Nature has, as a rule, fixed or limited the number of teeth in the jaws of man; still, there are individuals who are the sport of nature. In proof of which, several eminent authorities, ancient and modern, have cited cases where persons of sixty, four-score, one hundred, and even one hundred and twenty, have cut new teeth. A patient of the writer's, cut right and left upper canines eleven years after a suction case had been made by him, the patient's age being forty-seven when suction case was made. In "Bell, on the Teeth," a case is mentioned of an old lady cutting four front teeth. Then there is the case of the highly eccentric Mrs. Lewson, or Lady Lewson, as she was generally called, who lived ninety years in the same house in Coldbath Square, and died at the age of 116. She never washed herself, as she said washing gave people colds, and others disorders. At the age of eighty-seven she cut two new teeth, and never had known what toothache was. There is the case of the Countess of Desmond, who is said to have lived to the great age of 140, and renewed all her teeth. However, we must look upon all such cases as the expiring efforts of nature; or, as the emblem of a tree almost withered, which, by an extraordinary effort, produces fruits and flowers, and then suddenly dies. To all such cases the following epitaph on a tombstone in a country churchyard fitly applies, as well as forms a fitting sequel to the above remarks:—

> "Here lies an old person, once toothless and hoary,
> Who renew'd all his teeth, and his health, and his hair;
> And then was cut off in the height of his glory,
> After living two ages devoid of all care."

A NEW AND ORIGINAL METHOD OF TREATING EXPOSED PULPS.

By William Victor Ditcham.

Every educated member of the Profession will agree with me when I say that the preservation of exposed pulps is a most important operation, and one the results of which, up to the present, are far from what they might be. I have lately been experimenting upon an entirely original method for their preservation, with very gratifying results. The procedure is as follows:—

Procure a piece of clean metal (that used for working celluloid will do very well), about No. 6 in thickness, and cut a square piece the size of the bottom of the cavity to be operated in; in the centre of this cut a small hole large enough to receive a platinum tube (one taken from a tube tooth answers admirably); insert the tube in the centre, and soft solder together: the cap may be bent slightly convex. This is then placed at the bottom of the cavity, directly over the exposed pulp, resting on the dentine, and is fixed there by "fossiline," and completely covered with the same (I am here speaking of the cap only)—and, as far as oxychlorides go, up to the present I consider fossiline the best. This effectually holds the cap in position, and when once set, it is difficult to move. We can then fill with whatever material we consider suitable. If gold, a piece of pin wire, with a round head, kept for the purpose, should be inserted in the tube, to protect it from being compressed during consolidation. We have thus a very direct and certain means of treating the pulp. Apply a small crystal of carbolic acid through the tube, and then close it by inserting a small screw with a rounded head. It is understood that a thread must be cut in the tube about 1-16th of an inch in length to effectually secure the screw, and thus completely seal the tube. The tube must be carefully adjusted evenly with the masticating surface, and with regard to the articulation of the antagonising teeth. For the treatment of alveolar abscess, suppuration, &c., I believe it bids fair to become a very successful operation. We can thus treat the tooth mechanically at once, and leave the surgical treatment to be entirely independent. The screw can be removed by patients if necessary. We can treat a pulp with much less difficulty and trouble, and the annoyance of having to remove and insert fresh dressings, and seal up with mastic, &c., entirely avoided Further, we are saved the uncertainty of any pressure resulting from a freshly-inserted dressing, and thus irritating the pulp. I have performed this operation seventeen times, and in every case with success, and can assuredly say that the beneficial results were brought about in a much shorter time than by the previous method of dressings on wool, &c. When the treatment is complete, the screw is removed and substituted by gold foil or hickory wood (the latter I have not yet tried). I shall be glad if some members of the profession (careful operators) will test this operation, and make known their experiences.

A CASE OF ODONTOME ODONTOPLASTIQUE.

By Alfred J. Prager, L.D.S.I.

Abnormal growths like the following are sufficiently rare to warrant their being put on record when met with, together with some description relative to the conclusions arrived at regarding their nature and histology.

The odontome under notice, representing a right, second upper molar, was taken from the mouth of a man, about 30 years of age. There was nothing about the mouth to specially indicate the presence of such a mass, beyond a slightly swollen and hard appearance of the gum over the tooth, and the protuberance of a cusp-like enamel nodule. This was at first thought to be either a retained temporary, or a supernumerary tooth, but which, on closer examination, was found to be adherent to the molar tooth. The mouth and teeth in general seemed otherwise perfectly normal, with the exception of the absence of the right upper *dens sapientiæ*, which had never been erupted. The tooth was removed with difficulty; it was very adherent to the alveolar process, and the patient suffered great pain. The accompanying drawings, which I have made of the tooth, give a better idea of its general appearance and form, than a mere verbal description could convey. These drawings are slightly enlarged.

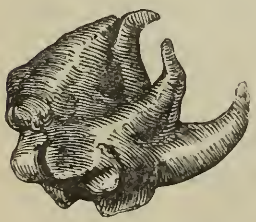

Fig. 1.

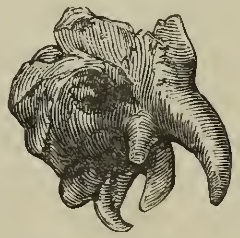

Fig. 2.

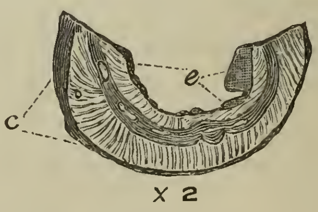

Fig. 3.

In Fig. 1 the tooth is viewed with its buccal surface directed backwards, and the enamel cusp-like nodule before mentioned, is seen just above the crown, and nearly in a line with the neck of the tooth, forming the termination of the tumour-like mass, which wholly surrounds the anterior buccal fang of the molar, and, when *in situ* in the mouth, occupied its mesial aspect.

Fig. 2 shows the mass to better advantage, viewing it more on its palatine surface. It has a lobulated appearance, with several small bony excrescences, and its entire surface is apparently composed of crusta-petrosa, save where it terminates abruptly, near the crown of the molar, in the enamel cusp.

Fig. 3 illustrates a transverse section of the part of the tumour on a level with the neck of the molar. This indicates that the mass has a large central cavity, lined with enamel; the larger portion on the right was continuous with the enamel of the tooth.

The microscopic structure shows that the mass belongs to the group of "Odontomes Odontoplastiques" of Professor Broca's classification. While there is " hermia of the fang," as designated by Mr. Salter, who objects to the title "Odontome Radiculaire" of Broca, there is also a deposition of enamel upon the wall of the large pulp (?) cavity, in which the letter *e* is placed in the figure, The external tissue is cementum only; this is of considerable thickness at *c*, and there contains some encapsuled lacunæ, and traces of calcified blood-vessels. On the right it is thinner, yet having several laminæ, but only few lacunæ.

In the substance of the dentine there is a true pulp cavity. This, in general, follows the outline of the mass, is semi-circular, and largely filled up with secondary dentine of indefinite structure. The dentinal tubes run to this from both the convex and the concave surfaces of the dentine. This, therefore, has been the developmental centre of the whole of the dentine of the growth.

The section has some resemblance to that of an incisor of a young horse, taken from near the cutting edge; the central cavity, in which the letter *e* is placed, corresponding with the " mark." The differences being in the absence of cementum upon the concave surface of the enamel, and the absence of enamel between the dentine and cementum.

ODONTOME ODONTOPLASTIQUE.

At the meeting of the Clinical Society, on the 14th ult., as reported in the *Lancet*, Mr. Christopher Heath read notes of a case of large odontome removed from the lower jaw. This, he said, was one of the rare tumours described by Broca as "odontomes odontoplastiques," and consisted of a mass of dentine, studded with nodules of enamel.

The mass weighed 315 grs., and measured 1½ in. by 1¼ in. The patient was a young lady of eighteen, who had never been able to close the teeth properly, but otherwise was supposed to have gone through the first and second dentitions naturally. Last Christmas she had some pain and uneasiness about the right angle of the lower jaw; and in April her father, a dental surgeon, extracted the second bicuspid tooth, there being no molars then present. A dentist, who was frequently consulted, thought he detected an encysted tooth, and tried to extract it with the elevator. The result was an acute attack of periostitis. Profuse suppuration ensued, and, on firm pressure near the angle, pus could be forced up from the interior of the bone. Under treatment the inflammation subsided, and the patient went to the seaside, and on her return there was apparently some exposed bone, with greatly hypertrophied mucous membrane on each side. A month later, after imprudent bathing, sudden increase of pain and swelling took place, and she consulted Mr. Heath, who found great enlargement of the bone, with a fungus-like growth in the mouth, and apparently bare bone, the appearances closely resembling those ordinarily found in a case of sarcoma of the jaw. An operation, involving removal of a portion of the jaw, was declined, and the swelling slowly diminished again. In September Mr. Heath undertook an operation for removal of the supposed sequestrum of bone, and, after considerable trouble, succeeded in elevating the mass described from its bed, since which the jaw has slowly contracted to its proper stage. In reply to a member, Mr. Heath said that he was not aware of any history of a direct injury at an early age. The President said the case was one of great interest, practically in the fact of its close resemblance to a tumour of the lower jaw, and its removal by mere extraction; and pathologically in its structure—composed as it was of dental tissues. Such cases are rare, and it was important, as Mr. Heath had said, to be on one's guard against removing a portion of the jaw by mistake.

REVIEW OF BOOKS.

Manual of Dental Surgery and Pathology. By Alfred Coleman, L.R.C.P., &c. London: Smith, Elder & Co.

This book is intended as a systematic and practical treatise upon Dental Surgery. The consideration of such branches of the specialty as Dental Anatomy and Dental Mechanics rightly finds no place therein. Beyond question, the day is past when a new work on Dental Surgery should include chapters on those ramifications. Each of them is of sufficient importance to deserve, as they have already received, special consideration. Mr. Coleman has had a large amount of experience as a dental surgeon and as a teacher; he is, therefore, in an eminent position to relate the conditions and diseases which he has found to exist, with their most successful treatment, and, at the same time, supply what the student wants.

It is stated in the preface to the book that its pages have been gone over by a reviser; but in face of that it is a matter for much regret that so many examples of bad English and of ambiguity exist. Let the former statement be justified by reference to the second paragraph on page 1. There we read "and the process has," &c. These words are probably intended to refer to the *eruption* of the teeth, but in the text the word "process" is erroneously related to the past verb "furnished." Other instances are to be found on pages 8, 29, 34, and 75, &c. The first sentence on page 57 will serve as an instance of ambiguity—"an undue relationship between the teeth and the maxillæ." Is the relationship one of proximity, or one of size? We suppose it is one of size, but there should be no cause for doubt.

After treating the subjects of the first dentition; the order and periods of eruption of the teeth; normal and abnormal conditions occuring during teething; irregularities in the temporary teeth; and diseases of the temporary teeth; the author deals with the question of the eruption of the permanent teeth. Two theories regarding the means by which the teeth are erupted are briefly discussed and disagreed with; and, instead of the teeth coming into position by either the lengthening of their fangs, or the growth of bone at the deeper portions of their alveoli, Mr. Coleman offers his opinion as the only probable explanation of the eruptive process, viz., that it is due to the general growth and advance of the bone towards the surface, carrying with it the contained teeth. He says:—

"This assertion consequently implies a continual growth of bone (as is the case with epithelia, cartilage, &c., &c.) from its nutrient centres towards its circumference, and also that, at the latter, absorption must be frequently taking place, as we have evidence of its occasionally doing during the process of absorption of the temporary, and advance of the permanent, teeth, where portions of bone—platforms, as they might be called—supporting the former are often seen extending much beyond the general level, as represented in the woodcut, which platform becomes absorbed as soon as the sustained teeth fall out. To what tissue or structure this power of absorption pertains, we will not venture to decide, though we are inclined to the conclusion that it is effected by the osteo-blastic layer of the periosteum assuming an osteo-elastic function. But that such power exists none, we think, can deny, from the foregoing considerations, as also when we take into account those conditions of loss at certain parts and gain at others which take place in the inferior maxilla between childhood and manhood; moreover, it affords a more rational explanation of the exfoliation of teeth and roots, when unopposed by pressure, also of sequestra of bone, than the assertion that nature casts off such because useless. . . . . . . According, then, to the views advanced, a tooth developed in the maxilla is carried with the growth of that bone towards the surface. Arriving at the surface, the bony covering becomes absorbed, and the more so as the tooth advances, until the crown projecting above the surface meets with some opposition to its further advancement, and is retained in position, when the bone immediately surrounding it, its alveolus becomes more dense in character, and less rapid in growth, than the surrounding cancellous interalveolar portions. These harder portions of bone being more stationary, we have, doubtless, so to speak, bone currents continually existing in the maxillæ, but more especially during the periods of the first and second dentitions, when these bones are in a condition of more than ordinary active development."

Irregularities in the size, form, position, and number of the permanent teeth receive attention in Chapter III. In speaking of odontomes odontoplastiques our author states that "the chief bulk of the growth will be found, as would be presumed, to consist of secondary dentine." The term "secondary" implies that there is a primary, and it is understood that these terms refer to the order of formation. As is well known, there are differences in the minute structure of secondary dentine, and also differences in its pathological significance and relation to the pre-existing dentine. Clearly, therefore, the term secondary dentine is more strictly applicable to the order in point of time of the production of the tissue, than to express any definite structure. Secondary dentine may be attached to and, in structure, simulate more or less closely the primary dentine, as pertains with dentine of repair; or it may exist as isolated masses in the substance of the pulp, and have some resemblance to the structure of osteodentine, and be the result of a retrograde development. Having in view these varieties in the histology and the pathological bearings of secondary dentine, there is too much inexactness in the statement that the chief bulk of odontomes odontoplastiques consists of secondary dentine.

It may be observed, that Mr. Coleman does not, in connection with supernumerary teeth, use the term supplemental, as suggested by Mr. Tomes, to express an extra tooth, which is normal in form and position.

Of the causes of irregularity in position of the permanent, no mention is made of a not uncommon cause, namely, the premature extraction of the temporary teeth.

(*To be concluded*).

A DENTAL LEDGER. By W. FINLEY THOMPSON, M.D., D.D.S.
London : The Dental Manufacturing Company.

The value of a properly arranged and well kept record of the detailed operations upon the teeth we shall not now set forth. Such is well known to the majority of Dentists. But the facilities for readily entering in a book the necessary details of each operation, are almost entirely centred in the descriptive form of illustration and nomenclature used. These Dr. Thompson has successfully produced; and he has, we believe, found them of so much advantage in his own practice, that he offers them to the profession.

AFTER THIRTY-EIGHT YEARS' PRACTICE.

By HENRY S. CHASE, M.D., D.D.S., ST. LOUIS, MO.

(Prepared by invitation of the Wisconsin State Dental Society, for their Eleventh Annual Meeting, in Milwaukee, July 19th, 1881.)

AFTER thirty-eight years' practice in the profession of Dentistry, I have seen many changes and some improvements. I hope and think my own experience and close observation of the results produced by my brother Dentists have been of benefit to my patients. And now I will tell you what my practice is to-day.

Fill all cavities not in sight with the best amalgam to be had.

Test every new batch of alloy by glass tubes and analine alcohol.

Varnish all cavities before filling with anything; use sandarac or shellac for gold or amalgam cavities ; copal ether for all bone fillings.

Fill front teeth and cavities in sight with phosphate of zinc, and paint over the surface of the same fillings every eighteen months with the same substance.

Protect *cervical* margins of cavities filled with metallic filling with gutta-percha.

Have clear separations between filled teeth, so that cleanliness may be insured.

Non-cohesive gold foil, in cylinders, preferred to any other form.

After killing pulps, wait ten days, in order that the dead part may separate from the living part, before removing the dead part. After removal, cleanse root-canals with alcohol, and fill with thick solution of sandarac or shellac. In treating periostitis from dead pulp, drill needle-sized hole through to the pulp chamber, exactly at the edge of the gum and beneath it.

Fistulæ to be cauterized through roots with *creosote*, until it appears on the surface of the gum.

Chronic and constitutional periostitis, improperly called " Riggs's disease," to be treated constitutionally, according to indications, and, *locally*, by chloride of zinc, carried under the gum as far as a small and thin instrument will go without cutting the tissues. In nearly all cases, *salt* is prohibited as food, and all stimulating and fiery condiments. The juice of one lemon each day is to be swallowed. Once or twice a week the roots to be scraped and the zinc applied.

Be careful of *over*-treatment.

At the age of twelve years four permanent teeth to be extracted. Sometimes the four sixth-year molars, or four bicuspids, selecting the poorer of these teeth. This improves the condition of the oral cavity. The remaining teeth are better preserved, and the spaces sufficiently filled before twenty years of age.

Spiral springs, to hold an under set of teeth in place, are of great service. They are invaluable when the under-jaw is very flat. They were much used thirty years ago, and should never have been so generally abandoned by the Profession. (Look in the January, 1881, number of the *Dental Cosmos*, and see the article of Dr. Evans, of Washington, with illustrations.) In my own practice, I place the *pins* between the bicuspids, both above and below. Length of spiral two inches, of ten-carat gold—*never silver.*

Amalgam alloys were so unsatisfactory twenty years ago that I would not use them, except in rare instances. Six years ago there were one or two good ones for sale. To-day there are better ones than six years ago. We have a right to expect that far better filling-materials will be used ten years from now than we are able to obtain at the present day. We especially need an improved "bone" filling.

I take pleasure in saying that I have made, and am using, an amalgam alloy which is perfectly *alcohol-tight.* Aniline alcohol is entirely kept out of glass tubes filled with this alloy. In Dr. Flagg's book on "Plastic Fillings," is hinted the use of zinc, and to that I am indebted for using zinc in the formula which proves to give such satisfactory results. My formula has not been published, and I take pleasure in giving the Wisconsin State Dental Society the first written formula. My new alloy is made as follows:—Melt forty pennyweights of pure silver; add to this thirty pennyweights pure tin: stir it, then add five pennyweights of antimony, and five pennyweights of pure tears of zinc. When mixed, add thirty pennyweights of pure tin again; stir, and throw on the surface of the "melt" one half ounce of beeswax to burn off; and, while burning, pour the "melt" into the *cup* of a vulcanizing flask to *cool.* Cut it up with very coarse file. Remove every particle of iron with horseshoe-magnet. This amalgam must be washed in alcohol while mixing with mercury. Squeeze it in dry buckskin. This amalgam is *whiter* for washing, and takes less mercury. Squeezing injures some amalgams; it does not hurt this. The amalgam pellets must be dry when placed in the cavity. This amalgam remains very white in the mouth. If *all* the tin should be melted at once, the antimony and zinc would never melt. If the antimony and zinc are put in the melted silver before the tin, then the antimony and zinc will burn up or oxidize. Varnishes seal up the ends of tubuli. The *gum* in the varnish is a poor conductor of heat and electricity. Gold fillings, being generally *leaky*, are improved by varnishing with sandarac alcohol, before they get wet with saliva or water. The varnish seals up the *leaks*, and becomes semi-hard by after-contact with the saliva. Leaky amalgam fillings are much improved by the same operation.—*Dental Cosmos.*

CYLINDER FILLING.

Dr. G. J. Friedrichs, New Orleans, read a paper before the twenty-first annual session of the American Dental Association, on "Cylinder-Filling," after the method introduced to the Profession by Dr. John S. Clark, in 1855, which, the writer stated, was received at the time with indifference. The essayist demonstrated, first, the manner of preparing the cylinders; second, the instruments necessary to pack them; and, third, the manner of introducing them so as to make an impervious and solid filling.

If a sheet of foil be folded upon itself, we have a sheet, parallelogram-shaped, of one-half the original size, but double the thickness. Repeating the process five times gives a strip of foil thirty-two times the original thickness; the flexibility decreasing as the number of layers increases. Therefore, to make small cylinders, and yet have them soft and pliable, the sheet must be cut before folding into halves, thirds, fourths, &c. The smaller sizes are not in the market, and the writer believed that in the lack of applicability of the cylinders prepared for sale, was to be found the reason why this method of filling has not been more generally adopted.

The instruments necessary to the production of cylinder-fillings as taught by Dr. Clark, are similar in shape to Nos. 19 and 20 of Redman's set of pluggers. They are round-pointed, the shank bent at an angle of about thirty-five degrees, slightly tapering from shank to point, and spring-tempered. At least a dozen sizes are required to form a set, the smallest to be about the diameter of a cambric needle, the next a third larger, and so on, the length from shank to point to increase proportionally with the diameter.

In making a cylinder-filling, the first cylinder should be as large as can be conveniently introduced into the cavity, and of sufficient length to extend from the bottom of the cavity, and protrude a little from the orifice. This is placed in the cavity, care being taken that it does not choke, but extends clear to the bottom. With the largest-sized instrument that can be used, it is then forced against the parieties of the cavity, thus providing space for the next cylinder, which is introduced and forced to place in the same manner; and so on, until the cavity is full, although not densely packed, when one of the small-sized instruments is forced between the cylinders, the opening thus made being enlarged by the introduction of the next larger-sized instrument, and another cylinder is introduced. This process is repeated as often as is necessary, the gold being packed as solidly by lateral pressure, as in the judgment of the operator, the tooth will stand. After this the surface is condensed, dressed down, and polished.

The points of excellence of this form of filling were summed up as follows:—

First. A lamina of gold, extending from the bottom to the surface of the cavity, making it impossible for a cylinder-filling to come out piece-meal—it either comes out *en masse*, or it stays where it is put.

Second. The lateral pressure on the soft gold will produce a perfect adaptation to the parieties of the cavity.

Third. Where the tooth is strong enough to bear the pressure, a solid and impermeable filling can be put in by lateral pressure alone.

Fourth. No retaining pits are required.

Fifth. Rubber-dam may be dispensed with; and matrices are not required in filling approximal cavities, the protruding ends of the cylinders furnishing material for the desired fullness.

Sixth. Submarine fillings may be made.

Seventh An impervious filling can be made in less time, and with less labour and more certainty, than by any other method. After the cavity is prepared and the cylinders are made, any cavity, no matter where situated, or whether large or small, may be filled, ready for condensing, in ten minutes.

Difficult cavities become simple ones when cylinders are used. An artificial crown cannot be built up with them; but whatever else can be done with gold for the preservation of the teeth, may be effected with cylinders. When crystal foil or cohesive gold is used, those only succeed who take sufficient time to pack the gold carefully against the parieties of the cavity in small quantities; unless this is done, no amount of malleting afterwards will make a perfect filling, as the mass has a tendency under pressure to contract rather than spread. A cohesive filling remains in contact with the parieties of the cavity from mere adaptation, while a cylinder-filling is maintained in position, not only by adaptation, but by the tension of lateral pressure besides.

The only method by which a root-filling can be made with certainty is on the principle of cylinder-filling,—the gold, rolled into a cone, becomes a part of the instrument. The first cone is introduced with the foil-carrier, and a piece of untempered steel, an inch and a-half long, the thickness of a darning-needle, and tapering to a point, is forced up beside the gold with a pair of flat-nosed pliers, making room for the second cone, and so on. The cones are prepared by rolling strips of foil on a watchmaker's broach.

From the economic stand-point, the skilled labour and time employed are the valuable factors in the filling of teeth; the value of the material used is comparatively of no consequence. Therefore, a sufficient number of fillings, put in at even moderate charges, will return a fair remuneration; but if it takes three hours to insert a filling, the fee must be in proportion to the time and labour expended. Hence the cry on the part of a certain class for a cheaper material, on the plea that gold-work places the services of the Dentist out of the reach of the majority of the people. Then, again, packing or malleting for hours makes your patients suffer the torments of the damned. The consequences are that gutta-perchas, oxychlorides, and amalgams are invoked, and these are placed on a par with a material that has stood the test of time.—*Dental Cosmos.*

OPERATION FOR NECROSIS.

THE following account of an operation, performed before the New Jersey State Dental Society, July 21st, 1881, by Dr. Geo. A. Mills, Brooklyn, is taken from the *Dental Cosmos*:—

The patient, a robust young man, of about thirty years of age, I had not seen until a few hours previous to the operation. The history of the case is briefly this:—About eight years ago, while splitting wood, he was struck in the mouth, knocking out, as he supposed, one of the upper incisors. Inflammation set in, followed by a discharge of fetid pus, mostly through an opening into the left nostril. He fell into the hands of a Dentist who diagnosed the adjacent tooth to be the cause of the trouble, and extracted it. The patient obtained no relief, and the discharge of pus continued up to the time of the operation. About three months ago, the case came to the attention of Dr. Charles Hubbard, of Brooklyn, who diagnosed necrosis, but did not discover the cause of it until he learned of the accident above mentioned, and that the tooth, which was supposed to have been knocked out, had not been found. Ascertaining by probing that it was still remaining in the jaw, he transferred the case to me for operation. I dissected away the gum tissue attached to the upper lip, making an incision about one and a-half inches long. Dissecting back, I discovered a necrosed condition of the parts contiguous to the buried tooth. With a bur in a surgical engine, I enlarged the orifice in the direction of the tooth, which was lying in an oblique direction, nearly half an inch above the apex of the left cuspid, and between the point of the root of the cuspid and the left portion of the base of the nose. It proved, on further investigation, that the tooth had been driven into the transverse process between the two plates of the superior maxilla. By cutting away the portion of the bone to the left of the foreign body, and enlarging the opening sufficiently for its ultimate removal, after stopping the hemorrhage, and drying out the cavity, the cutting edge of the tooth was readily discovered. An attempt was made to remove it with forceps, but it slipped back into the enlarged cavity which had been created in the vicinity by diseased action. Two hooked instruments were then employed, and its extraction effected. It was quite extensively fractured on the cutting edge, and necrosed some three-eighths of an inch from the apex back upon the body of the root. One curious circumstance was discovered after its removal, which was, that the gum-tissues surrounding the neck of the tooth when in its normal position, had been partly stripped from its attachment to the process, and carried with the tooth into the location in which it was found, some slight connection with the myxomatous tissue being maintained, which had sustained its normal condition of vitality through all these years. After removing the tooth, the cavity was syringed out with lukewarm salt water, and quite an amount of broken-down tissue was forced out through the opening into the nostril. Dressing with a weak solution of arnica and water, the flaps of the wound were laid together, and covered with a pack of cotton. Of the final recovery, and entire healthfulness of the parts, there is no doubt, and without disfigurement that will not be entirely remedied by the insertion of two artificial teeth. The operation was performed without the administration of any anesthetic, and occupied about three-quarters of an hour.

EXEMPTION OF DENTISTS FROM THE DUTIES OF CITIZENSHIP.

A "LICENTIATE in Dental Surgery" recently asked whether he could claim exemption from serving on juries. We assumed the question addressed to us to be substantially whether he could claim as a "licenciate" of the College, and we informed him that he could not do so. It, however, remains that, under the Dentists Act, any registered person, whether he be the village blacksmith or a chemist and druggist, can claim immunity from the obligation of citizenship. The knowledge of this fact possibly had some influence with the multitude of those who got their names placed on the list immediately after the passing of the Act. It was worth while for any tradesman to profess to have been a hewer or drawer of teeth in order to obtain this privilege.

When opportunity offers, it will be well to ask Parliament to consider whether it is right or consistent with the obligations of good citizenship to allow the promoters of Acts of Parliament to introduce these exemption clauses into Bills with the view of rendering them popular. It seems monstrous that an exceptional privilege, originally intended for the public good, by preventing the possibility of a practitioner of medicine being interrupted in his daily duty of ministering to the safety of human life, should be converted into a complimentary boon, to be conferred on any one and every one who joins a class over which the Legislature has deigned to cast its protection. Hitherto only men who have passed through the necessary curriculum for a medical or surgical qualification—thus devoting a large portion of their time and money to the study of a profession—have been exempted. Now any man who can register as a dentist is so privileged. Thus the immunity, originally intended for the public good, has become a boon conferred on registration. This section of the Dentists Act must certainly be repealed; but of the Act as a whole we say, "Reform it altogether." —*Lancet.*

HAMMOND'S WIRE SPLINT.

Mr. Isidor J. Lyons, writing to the *Lancet* upon Hammond's wire splint, says, I beg to be permitted to take exception to the remark contained in your review on Mr. Coleman's new work, entitled "A Manual of Dental Surgery," with reference to the drawing depicted in it of Mr. Hammond's wire splint. You say, the "thin wire being in one long piece, in place of separate pieces for each tooth, is most ingeniously but impracticably twisted in and out." I have treated five cases of single compound fracture of the lower jaw in that manner, and have never found the slightest impracticability in doing so. Doubtless my experience is far less than that of Mr. Hammond, but this experience (extending to thirty cases of single, double, and triple compound fractures of the lower jaw, seventeen of which were treated by iron wire) has taught me that the thin wire twisted in and out two, three, or four teeth, as the exigencies of the case may require, gives greater immobility to the fractured parts and firmness to the splint.

To this Mr. Hammond replies as follows:—

I feel called upon again to trespass on your valuable space, and to show that although Mr. Lyons, in his letter of the 5th instant, would *primâ facie* appear to have improved on my method of using the thin wire, in reality he has only gone back to what I did at first, viz., using a long piece of thin wire, and winding it in and out several teeth. But I soon quite gave up this long wire, as I found it to be very bad, for many reasons. Had I thought it possible that there could be two opinions on the subject, I would have given my reasons in my first letter. However, they are these :—

1st. I found that drawing a long wire between the teeth—and, indeed, sometimes through the gums, owing to the swollen state of the mouth, often seen in these cases—was exceedingly painful to the patient, who generally became restless.

2nd. The passing of a long wire frequently cut and sawed the gums, &c., and caused much bleeding, which, of course, greatly increased the difficulties of the operation, especially when the teeth were crowded.

3rd. If the long wire got cut, worn, or rusted through, as it sometimes did after a few weeks' wear, the whole side became loose and useless.

4th. Owing to the attachment of teeth by gomphosis to their sockets, each tooth has the habit of turning and moving itself away from any undue pressure brought to bear on any one particular part or side of it : and from this cause the splint, although very firm and tight when first put on, became (after a few days, or even hours,) more or less loosened. This is also sometimes the case with the short ligatures, but each one can then be twisted tighter if necessary, independently of the others.

Lastly. As it is very unusual to find all the teeth in a mouth sound, a tender one, when made to bear the same strain as a sound tooth (which cannot be avoided when a continuous wire is used), has often set up an alveolar abscess, and obliged me to undo the whole length of wire.

For these (I think full and sufficient) reasons I adopted a short wire, of about three inches in length, and passed it round each tooth in the particular manner described by me, and quoted in Mr. Bryant's "Surgery."

I will only add that, with my experience of some 250 cases, or more, during the war and since (and I have set all kinds of fractures in the upper as well as in the lower jaws with my splint), I consider the separate ligatures to be absolutely necessary for the best results to be obtained with it.

RELATION OF MICRO-ORGANISMS TO INFLAMMATION.

By Joseph Lister, F.R.S.,
Professor of Clinical Surgery in King's College.

Prof. Lister delivered an address before the Pathological Section of the International Medical Congress, in opening a discussion on the relation of micro-organisms to unhealthy processes arising in wounds. The address is reported in full in the *Lancet*, from which we reproduce the following abstract. The subject is one immediately relevant to Dental practice, and these observations of Prof. Lister—the father of antiseptic surgery—are especially at the present time significant. After some introductory remarks, Prof. Lister said:—While I am more than ever convinced of the importance of the relations of micro-organisms to diseased processes in wounds, I propose this morning to utter what seems to me a needed note of warning against a tendency to exaggeration in this direction. This exaggeration, if such there be, is largely due to the success of antiseptic treatment. If we treat our wounds by means expressly calculated to exclude altogether the entrance into them from first to last of minute organisms, not only are the specific diseases got rid of, not only do hospital gangrene and pyæmia, those scourges of former surgery, fly away as at the touch of the enchanter's wand, to trouble us no more for ever, while septicæmia also vanishes, and erysipelas, though more stubborn, is robbed of its terrors—not only, I say, do these diseases, recognised as specific, disappear, but, if the treatment is properly conducted, we get rid of inflammation altogether. Such results, proceeding from a mode of treatment designed especially to exclude bacteria, may suggest the idea that all inflammation is caused by micro-organisms, and that suppuration, whether acute or chronic, is always due to similar agencies. Gentlemen, this I believe to be a very exaggerated view of the matter, and a view which may tend to have a serious influence upon our practice. For example, if we believe that inflammations are due only to an invasion of microscopic parasites—if that is the sole cause of inflammation in every case, to what purpose is it to employ counter-irritation? Counter-irritation would seem an absurdity under such circumstances. Again, in the case of those important diseases which we term strumous, the languid degeneration of tissue which we see in feeble constitutions, there is at the present time a tendency to look upon this as altogether of an infective nature. This, also, I believe, to be an exaggerated view, and one which may injuriously affect our practice. Acute inflammation is certainly very often caused by the products of decomposition, the results of fermentation induced by the development of minute organisms. Of that we have abundant proof; but we have also sufficient evidence, as it appears to me, that inflammation is often caused otherwise—viz., through the nervous system; that, in fact, the ancient principles of John Hunter with regard to sympathy were true principles. I imagne that all physiologists will admit that determination of blood might be induced through the nervous system.

Counter-irritation seems to be based upon a law in physiology, which I may take the liberty of illustrating by some simple examples. Suppose a fly settles upon the skin of the face: we experience an intolerable sense of itching; we rub the part with the finger, and the itching disappears—a fact familiar to all the world. But now I find that the same effect of removing the sense of itching takes place if, instead of rubbing the actual spot on which the fly settled, I rub in a ring round it, without touching the spot at all. What is the interpretation of those facts? In the first place, I suppose the sense of itching depends upon an abnormal action of the sensory nerves of that particular spot on which the fly settled. By rubbing a ring in the vicinity I call into play a strong action of the sensory nerves of a neighbouring part of the skin which is in sympathy with that part on which the fly settled, by virtue of the same nervous connection through which the skin of the chest blushed as the result of a tight stitch. And this new nervous action occurring leads to the cessation of the abnormal action which was previously going on; as if the attention, so to speak, of the nervous system were distracted from the affected part. That may seem a very homely illustration; but if the interpretation is correct, it serves the purpose none the worse on that account. Suppose, again, we feel a sense of irritation in the Schneiderian membrane—a sense of irritation which, if it goes on, will relieve itself by the violent action of the expiratory muscles, which we term sneezing; and supposing we are desirous that this act should not take place—it would be inconvenient, perhaps, that we should sneeze—if with the hand we violently rub the tip of the nose so as to produce a considerable sense of uneasiness there, the sneeze is prevented. I do not touch the part affected with the abnormal sensation, but I call into play a strong action of the nerves in a part which is in sympathy with it—a part of the same nasal organ—and by so doing I cause the previous action to cease. That is another simple but instructive example of physiological counter-irritation, a term which I have ventured to apply to cases in which the excited nervous action which the counter-irritation removes has not overstepped the limits (indefinite though they be) which separate health from disease.

It appears, then, that it is a law of physiology that when two parts are nervously in sympathy with each other, if we excite a great action in the nerves of one we may distract action from the nerves of the other. Now this will serve to throw great light upon the nature of inflammation itself, if we find that counter-irritation is really a valuable means for the treatment of inflammation. If it be true that counter-irritation is a powerful means of treating inflammation, and if the explanation which I have given of the mode of the action of counter-irritation, as illustrated by the physiological cases, is correct, then, I say, the effect of counter-irritation throws great light upon the nature of inflammation itself, and upon the relation of the nervous system to it. If counter-irritation cures an inflammation by withdrawing nervous action from the affected part, it follows that the inflammation so cured was maintained by an abnormal action of the nerves of the part.

This conclusion is confirmed by the fact that it is in harmony with and elucidates the mode of operation of the most frequent cause of inflammatory attacks—exposure to cold. How does a chill of the surface lead to an internal organ becoming inflamed? Why should a draught of cold air upon the chest lead to an attack of inflammation of the lungs? First, it seems clear that in some way or other the effect is brought about by the nervous system; for the integument only is chilled, and the deeply-seated internal organ suffers, while the same law of sympathy or nervous connection which we have seen in counter-irritation applies equally here; it is the cooling of the skin nearest the internal organ that is most likely to cause its inflammation. And, further, the cold sometimes "strikes in" with a suddenness that conveys the idea of a nervous shock, and seems to preclude the hypothesis of any other agency than that of the nervous system. Next we have to ask what immediate effect does cold produce upon the nerves of the surface on which it acts? One effect which cold certainly does produce is to lower the activity of the nerves on which it operates. In this respect it is the converse of heat. It therefore seems natural to suppose that cold acts in causing inflammation exactly on the converse principle that heat may act in curing it; a diminution of the action of the nerves of a part of the surface leading to an increased action of the nerves of an internal organ in sympathy with that part. And this view of the matter is confirmed by familiar experience. Suppose a man is liable to inflammatory disorder of the bowels, what is the time when he must be most careful to keep his coat buttoned up when he walks out into the cold air? It is immediately after taking a hearty dinner; it is just at the time when there is the greatest amount of physiological activity of the organs liable to inflammation. When the nerves of the internal organ are already doing their utmost consistently with health, then it is that it is most likely to suffer from additional nervous action thrown upon it in consequence of depression of nervous activity in the chilled integument with which it sympathises—exactly the contrary effect, as it appears to me, to that of the actual cautery, the mustard poultice, or the hot fomentation.

I have next to say a few words regarding suppuration. Here we have not only the results of antiseptic treatment favouring the idea of micro-organisms being its cause, but we have actual observations of such organisms present in the pus. Dr. Ogston of Aberdeen has lately made some very remarkable observations to this effect.* He has investigated, by Koch's methods, a very large number of abscesses, and in every acute abscess which he has examined he has found the pus loaded with micrococci. Not only so, but, if he has an opportunity of observing it, he finds the pyogenic membrane infiltrated with such organisms. There you have direct observation which seems at first sight to imply that the micro-organisms are the cause of the suppuration. But this same accurate observer has also investigated chronic abscesses in large numbers, and he has not found micrococci present in any; and therefore this same authority himself teaches us that micrococci are certainly not the sole causes of suppuration. And when we turn to the acute abscess, it seems to me that Dr. Ogston leaves us entirely without any explanation as to the origin of the infection in the part in which the abscess occurs. If we are to suppose that the micrococci are really the cause of the suppuration, we must also suppose them to be the cause of the inflammation which precedes it. But the inflammation that precedes the suppuration may be induced by some altogether accidental circumstance. For instance, a woman during lactation, with the mammary gland in a state of high physiological activity, corresponding with that of the digestive apparatus of a person after a hearty dinner, as before referred to, is disposed to "take cold" in the part; and as the result of an accidental chill an acute attack of inflammation may occur, threatening milk abscess. If we get such a case to treat in the early stages, the inflammation may never go on to suppuration at all; it may terminate by resolution. But if left to run its course it causes abscess. We can hardly suppose that the accident of exposure to cold could lead directly to the development of micrococci in the part. Nor, even if this were admitted, can we readily understand how any treatment that we can adopt could lead to their dispersal if they were the essential cause of the inflammation. And, further, there is this to be added, that if we treat such an abscess antiseptically, we find exactly the same results as in a chronic abscess. I had a case under my care lately, in King's College Hospital, of a woman with a milk abscess of this kind, essentially acute. I opened it, and introduced a drainage-tube antiseptically, and there was not another drop of pus after the evacuation of the thick original contents—merely a serous oozing, and this rapidly subsided. Why did not the suppuration continue if the micrococci were the essential cause of it? I examined, along with Mr. Cheyne, some preparations which he was good enough to make for me, by Koch's method, of the serum that came from this abscess three days after it had been opened, and we had to make a long search before we could discover a single group of micrococci. The main mass of those which, from Ogston's observations, I cannot doubt were originally present, had been already almost entirely got rid of. No sooner had the abscess been relieved of the tension occasioned by the pus pent up within it (while at the same time the entrance of septic ferments was prevented) than the inflammation, following the natural bent of all inflammations when all causes of irritation are withdrawn, proceeded rapidly to subside, and the tissues of the pyogenic membrane and surrounding parts, regaining their normal vigour, were then able to dispose of the micrococci with which they were infiltrated, just as the organism disposes of ordinary bacteria of various kinds after they have been injected into the circulation. Surely the natural, if not the inevitable, interpretation of this course of events is that the essential cause that kept up the acute inflammation of the abscess and prevented it from subsiding, like that which maintained the chronic inflammation of the bursa patellæ, was the tension of the accumulated fluid, and that the presence of micrococci was of entirely insignificant importance. Hence I am disposed to regard the view which has been taken of this matter by Mr. Cheyne as the one most consistent with the present state of our knowledge—viz., that the micrococci are, so to speak, a mere accident of these acute abscesses, and that their introduction depends upon the system being disordered. It has been now abundantly established by the observations of Mr. Cheyne himself as well as by those of Dr. Koch and other observers, that in the healthy state of the animal body there are no micro-organisms present among the tissues. It is certainly a marvellous thing that the animal body is able so to fence itself against the introduction of these minute living beings so disposed to diffuse themselves in organic liquids, considering the innumerable channels which seem so well adapted for their reception ; the respiratory passages and the alimentary canal, with the openings of the countless ducts, cutanous and mucous. But so it is. It is only in a state of unhealthiness that the ordinary forms of bacteria can enter the circulation and establish themselves in the organism. It would appear that in the healthy body even pathogenic bacteria must enter in certain numbers to be able to survive ; even the most virulent forms of micro-organisms must be introduced in a certain amount ; if they are very much diluted even they cannot survive in the animal body. But with regard to these ordinary micrococci of which we are speaking, they do not survive among our tissues except in a state of disorder of the system, local or general. From what Mr. Cheyne has already published, we know that by lowering the system of an animal, such as a rabbit, by the administration of phosphorus, he has brought about a condition in which micrococci do enter the system, and are found in multitudes in the internal organs. Mr. Cheyne's idea, therefore, is that when an inflammatory attack is sufficiently severe to produce serious febrile disturbance, these micrococci get in, and, finding in the pus of an abscess a congenial soil, develop in it in abundance.

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* See *British Medical Journal*, March 12th, 1881.

ON SOME OF THE CONDITIONS LIABLE TO BE MISTAKEN FOR ACUTE GLOSSITIS.

By Stephen Mackenzie, M.D., F.R.C.P.,
Physician to, and Lecturer on Medicine at, the London Hospital, &c.

The mouth is a kind of neutral professional territory whereon the physician and surgeon meet, and hence it is that the physician is often called upon to diagnose and treat affections of the tongue. Acute glossitis is admittedly a rare disease, of which I have seen but few instances. I have, however, seen a fair number of cases mistaken for glossitis, and it is to some of these that I wish to draw attention.

(A.) *Salivary Calculus.*—Case I.—An intelligent, healthy-looking lad was sent to the London Hospital from Victoria Park Hospital, on account of the greatly swollen condition of his tongue, the mother being warned that tracheotomy might be necessary if his breathing, which was difficult, became more embarrassed. The patient's mouth was kept partly open, and he was unable to close it, on account of the greatly swollen condition of the tongue. He could neither speak nor move his tongue. The tongue was moist, of natural colour, and so swollen as to occupy the whole of the oral cavity. It was pushed somewhat backwards and upwards, so that the floor of the mouth was rendered visible, and this was filled with viscid saliva, which overflowed and ran out of the mouth. There was a somewhat hard, smooth swelling, unaccompanied by any redness, extending from the right angle of the jaw to the middle line. The patient had an anxious look, but his breathing, though hurried, was not seriously interfered with. He was sent to bed, and ordered to suck ice continuously. About midnight I was told his breathing was more difficult, but when I went to see him he had fallen asleep, and was breathing fairly easily, with his mouth kept open, and the swollen tongue slightly protruding. His mother, who remained with him, said that he would sleep for a few minutes at a time and then awake as if about to choke. I enjoined the persevering use of ice in the mouth. On the following morning, when I came to his bedside, he showed me something that he had found under his tongue. "He did not know what it was," he said, "but thought it might be an orange pip or a piece of a tooth." In a very short time after finding it "the tongue felt much smaller and he could breathe through his mouth." When I saw him he was able to close his mouth, and could move the tongue about in it a little. The tongue was still a good deal enlarged, and its surface, now for the first time visible, covered with a dirty white fur. When he raised the tongue a small round ulcerated opening could be seen on right side of the frænum, in the sublingual space, and through this there welled up a thin puriform fluid. The swelling beneath the angle of the jaw was slightly diminished in size. The little body he found under his tongue proved to be a small salivary calculus, which had ulcerated its way through Wharton's duct.* He could swallow much more easily and could now articulate, but in a very indistinct manner. The next day the swelling of the tongue had nearly disappeared, and he was able to give the following account of his case. He had had several attacks of swelling of the right side of the neck and jaw during the last few months, which were thought to be "mumps." The day before admission he felt a little fulness on the right side of his neck and jaw. When he awoke on the morning of admission he found he could not close his mouth, and could only breathe with difficulty through his nose. He was unable to swallow, and was feverish and ill.

Case II.—R. V., a warehouseman, aged 39, was admitted from the receiving room under the following circumstances, on September 6th, 1881:—

It appears that he had always been very healthy, having had no illnesses whatever, until three months ago. About this time he began to experience a little pain in the floor of his mouth, which daily increased in severity. A small lump formed under his jaw on the right side, and mastication soon was attended with a good deal of difficulty and pain. About a week after these symptoms first were noticed, his tongue began to swell, saliva ran from his mouth, and he had considerable dysphagia. He attended at St. Bartholomew's Hospital, where, from the description, it seems one of the surgeons removed a salivary calculus, probably from Wharton's duct. After the operation all the pain went away, the swelling of the tongue subsided, and he was able to return to his work. The lump under the jaw, although it became much smaller, never altogether disappeared.

About a fortnight ago he noticed a great deal of pain in the right side of the floor of the mouth, and the lump underneath commenced to enlarge and become tender. He experienced considerable inconvenience; mastication and deglutition became very painful; but he remained at his work until two days ago. At this time the tongue again became swollen, and as it was obviously fast increasing he applied for admission.

When first seen, his mouth was partially open, saliva was running from his mouth, and there was complete inability to protrude the tongue out of the mouth; the tongue was very red, swollen, and œdematous. On the floor of the mouth on the right side there was a well-marked, fluctuating swelling, which was inflamed and very painful; there was also a large glandular enlargement to be felt externally, whose seat corresponded to that of the submaxillary gland.

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* *Medical Times and Gazette*, June 24, 1871.

A free incision was at once made into the swelling in the floor of the mouth, and about half an ounce of very offensive pus was evacuated. Ice was constantly sucked. Patient experienced immediate relief after the operation.

The swelling of the tongue very quickly disappeared, and two days after the incision he was able to protrude it with ease, and had no difficulty in mastication or deglutition. On this day, whilst opening up the wound with a probe, a salivary calculus, oval in shape, and about the size of a swan-shot, was removed. On September 13th, he was discharged almost quite recovered.

(B.) *Acute Ranula.*—Case I.—The following are notes of a case, furnished me by Mr. J. H. Mitchison, I saw at the London Hospital in October, 1874:

The patient came to the receiving room complaining of severe pain and swelling of his mouth and tongue, and difficulty in swallowing. He said he was quite well the morning before, and that in the afternoon he first noticed that something was wrong with his mouth. Pain in his tongue came first, followed by swelling, and as night came on, these symptoms rapidly increased; the pain became very severe, and the swelling extended from his tongue to the floor of his mouth. He was unable to sleep all night, and the saliva constantly dribbled from his mouth, as he could not swallow it. He attributed his symptoms to a blow he had had on his face a day or two before. On close questioning he admitted he had had slight soreness of his tongue for a day or two previously. On examination his tongue was found to be much increased in size, especially on the right side; it was hard, hot, extremely tender, bluish-red in colour, and along the edge were small patches of opaque white material which looked like thickened and sodden epithelium. The floor of his mouth bulged up to a considerable degree, and was on a level with the alveolar edge of his lower jaw; it felt hard and hot to the touch, and was extremely tender. The patient looked much distressed, and was constantly with his handkerchief mopping his mouth, from which the saliva continuously dribbled. He looked unhealthy, and said he had been drinking freely for some days. He was sent to bed, a saline aperient was ordered, and he was told to suck ice freely. The next morning, the swelling of his tongue had considerably subsided, and it was less painful. The patient could swallow more easily. The other symptoms remained unaltered. I had some difficulty in convincing some who saw the case that it was one of acute ranula. There was, however, unmistakably a spherical swelling in the floor of the mouth pushing up the tongue, and this subsided in the course of a couple of days.

Case II.—For the notes of which I am indebted to Dr. Mercier, then acting as my ward clerk.

A male, aged 51, was quite well until the day before admission, when at about ten o clock in the morning he experienced pain under the chin and in the tongue, which rapidly increased, and at the same time the tongue quickly swelled. The day before this, he said, he had a small blister, the size of a pea, on his tongue. When seen in the ward on the day of admission (September 29, 1874), it was noted, "He sits up in bed with his mouth open, and the saliva dribbling from it. He seems to be in a good deal of pain, and says it hurts him to swallow. His articulation is extremely imperfect and hardly comprehensible. The tongue presents a thick round edge of about the normal colour. The chief swelling, however, is in the sub-lingual region, and at this part it is so great that the surface of the floor of the mouth is on a level with, or even above, the tops of the lower teeth. The tongue itself is hoisted up into the middle of the oral cavity, immovable, and useless. There is no sign of the 'blister' that he speaks of." The patient was ordered to suck ice diligently, a saline aperient was ordered, but no other medicine given. The swelling, glossal, and sub-lingual rapidly subsided, and disappeared by the second day, when he was discharged.

I have seen several other cases of acute ranula, in the surgical and medical wards, where the tongue has been much swollen and pushed up, giving rise to the belief that the patient was suffering from glossitis. I may mention also that disease in the sub-maxillary region will sometimes cause swelling of the tongue and sub-lingual space. A case of angina Ludovici (sub-maxillary cellulitis), was under my notice some years ago. In addition to the swelling of the sub-maxillary region, the tongue was a little swollen and pushed up to the roof of the mouth by swelling in the sub-lingual region.

Another case, in which acute swelling of the tongue was due to obstruction in the course of Wharton's duct, is the following :—

A boy, aged nine, was admitted into hospital under my care on October 16, 1878. He was stated to have had sore throat two weeks before admission. One week before admission, lumps were noticed in the sub-maxillary region. He was taken to a medical man, who ordered a lotion to be applied, but the lumps continued to increase in size, and he became quite unable to swallow. On admission it was noted, "He lies with his mouth open, the tongue protruded just outside the mouth. The tongue is coated posteriorly, its front and edges are red and glazed. It is swollen to about three times its natural size, the right half more then the left. It almost fills up the aperture between the upper and lower teeth. It feels tense and tender to the touch. The extreme point, which is outside the mouth, is dry from exposure. Saliva runs from the left corner of the mouth. The sub-maxillary glands are enlarged, and the tonsils, as felt externally (for they cannot be seen), appear to be swollen. The tissues of the neck are also slightly swollen: P. 120, T. 102°·6. He breathes with difficulty." The swelling of the tongue was so great, and interfered so much with respiration and deglutition, that the house physician deemed it expedient to scarify the tongue. This was freely done, and afforded him great and prompt relief. On the following morning about two ounces of bloody fluid spontaneously escaped from the floor of the mouth, which afforded him further relief. His tongue was not nearly so much swollen, and he had been able to swallow a pint of milk.

October 18th. Tongue greatly decreased in size, could swallow and speak tolerably well, though with a nasal intonation. Temperature normal.

On the 19th, whilst the tongue had almost regained its normal size, there was a hard swelling in the sub-lingual and sub-maxillary spaces, and a browny swelling of the sub-cutaneous tissues of the neck. This cervical cellulitis proceeded to suppuration, and subsided after the surgeon had made an exit for the pus.

(c) *Herpes of the Mouth, &c.*—A porter at the hospital, twenty years of age, complained of his throat on May 22nd, 1889. The resident medical officer found the pharynx and tonsils much congested, but the man did not seem constitutionally ill, and continued his employment. On May 26th, the throat having appeared almost well in the meantime, he again complained of soreness, but nothing more was observed than congestion.

On May 27th he complained of his throat and tongue, and the latter was observed now to be distinctly swollen. He then seemed ill, and there were some herpetic vesicles on his lips.

On May 28th, evening, the following was his condition:—The lips were a good deal swollen, and on the upper one were some dried-up vesicles. He held his mouth a little open, being unable to close it, and through the cleft could be seen the tongue, greatly swollen. It filled up the whole of the oral cavity, was quite dried and glazed, and of a clean red colour. He could only speak very indistinctly, and with great difficulty. The tonsils could not be seen, but they were felt, externally, to be enlarged and tender, especially the left. He complained of pains all over. The surface of the body felt hot and dry. His pulse was 114, resp. 30, temperature 103°·2. . . . . He was given an aperient, and made to suck ice freely.

On the following day, May 29th, the tongue was less swollen. He could open his mouth sufficiently to allow of the back of his pharynx being seen, and there was an appearance there, and on the dorsum of the tongue, as of imperfect vesicles. He still had pains about him.

Morning:	P. 75	R. 16	T. 99°·2.
Evening:	P. 96	R. 22	T. 101°.

On the following day, May 30th, the tongue was not so swollen. He could open his mouth a little, but was unable to protrude his tongue, which was dried and furred on the surface, moist beneath. He could swallow for the first time last night. This morning he had swallowed a little milk, but in the efforts to do so a good deal escaped from the mouth, and very little passed down. The attempts caused a feeling of pain in the root of the tongue. On the evening of the same day, the tongue was still less swollen, but more coated: on the roof of the mouth were several clear vesicles. A patch of herpes appeared to-day on the right malar bone. T. 99°.

May 31st. Tongue less swollen, but still painful. Still some vesicles to be seen on the roof of the mouth. T. 98°·6. In evening the tongue was greatly diminished in size, especially in its centre; the edges being still swollen gave the dorsum a sunken appearance. There appeared this day a new crop of herpes on the lobule of the right ear, and some new vesicles were seen on the pharynx. T. 98°·8.

June 1st. Better in every way. Tongue almost natural. Some vesicles under tongue. Temperature normal.

This case is of great interest. I must confess to regarding it, in the first instance, as one of idiopathic glossitis, and was only convinced of its herpetic nature by the progress of the case. The labial herpes I considered, at first, as symptomatic. The subsequent undoubted appearance of vesicles in the pharynx, roof of mouth, and sub-lingual space, with crops of characteristic herpetic vesicles occurring on the skin of the face, rendered its nature clear; and the subsidence of the swelling of the tongue, whilst the vesicles still continued to appear, showed that the latter were not in any way symptomatic of the glossal inflammatory œdema. I have seen several other cases of oral, pharyngeal, and even œsophageal herpes, the latter proved by *post-mortem* examination. Herpes, in these situations, is generally attended with serious inflammatory swelling, and I have known dangerous œdematous laryngitis to arise from pharyngeal herpes.

The cases to which I have drawn attention, indicate that disease in the immediate vicinity of the tongue, and especially in the sub-lingual region, is liable to be attended with acute swelling of the tongue, from fluctionary hyperæmia and œdema. It follows that when a case of acute swelling of the tongue presents itself, we should carefully explore the sub-lingual and sub-maxillary regions, and search for herpetic vesicles, before we pronounce the case to be one of primary, acute, or idiopathic glossitis. In the case of salivary calculus and acute ranula, the recognition of its nature will, by directing treatment to the essential disease, enable relief to be promptly afforded without interference with the tongue itself.

In true glossitis the tongue is, as a rule, more swollen, and protruded to a greater extent beyond the teeth, and not pushed up into the roof of the mouth. Some of these cases, however, show that these points cannot be held as absolutely diagnostic.

The cases also demonstrate the importance of continuous sucking of ice in diminishing the swelling of the tongue. The tongue consists of little else than muscular tissue and very numerous blood-vessels. Vigorous sucking of ice empties the blood-vessels and causes the muscle to contract, thus rapidly and effectually causing shrinking of the tongue. Where immediate danger from suffocation is apprehended, free vertical incisions into the dorsum of the tongue cause very prompt relief. Though, as a rule, such scarification is free from danger, serious hemorrhage has been known to follow and to be difficult to arrest. So that, unless immediate suffocation is threatened, I repeat, it is safer, and quite efficient, to make the patient suck ice freely.—*The Practitioner.*

PROVINCIAL DENTAL EDUCATION.

Regarding the facilities for education in dentistry at Leeds, the *Lancet* writes,—" In a subdued sort of way we cannot but approve the movement which is in progress in the provinces, and notably in Leeds, to provide for the teaching of dentistry. Our satisfaction would be complete if we could add that the facilities to be created will be available only for the instruction of students who have entered for the full medical curriculum. It may be *expedient* to teach dentistry to men who are about to qualify for practice as tooth-drawers and manufacturers, but it would be better to help members of the medical profession *only*, to acquire a sufficient knowledge of that branch of surgery which relates to the teeth. We cannot swerve in the least degree from the line we have laid down, and to which we have consistently adhered in relation to this specialty, and that line may be indicated in a single sentence,—that practitioners of 'dental surgery' should be *surgeons* first and dentists afterwards. The profession will act wisely and evince its self-respect by supporting only men who are thus qualified."

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

This Society, says the *Lancet*, has at last, under the presidency of Mr. Thomas A. Rogers, passed the following bye-law :—" That on and after November 1st, 1882, candidates for the resident, non-resident, or corresponding membership of the society shall not be eligible unless they practise as dental surgeons, or are interested in the progress of Dental Surgery, *and are also* licentiates in Dental Surgery, or qualified practitioners of medicine or surgery ; or possess such a diploma or degree as in the opinion of the council will qualify them for membership of the society." Is this to be looked upon as a step towards the adoption of the principle so firmly and loyally asserted by the Association of Surgeons practising Dentistry? Obviously that is the *only* principle which the Medical Profession can recognise. We cannot regard qualifications which do not imply membership of the Medical Profession as giving a title to recognition. It is with no ill-feeling to the members of the Odontological Society we adhere to our resolution that, as a society admitting unqualified persons to its membership, we are unable to acknowledge it as a medical body. If the Odontological Society will require a medical or surgical qualification of its members, we shall be sincerely glad to welcome it as a professional association.

ODONTO CHIRURGICAL SOCIETY OF SCOTLAND.

THIS Society opens for the Session, 1881-82, on the 10th of November, under the Presidency of Dr. Smith, who will deliver an introductory address.

The Endowment of Research in Dentistry will form the topic of conversation for the evening.

The Hon. Secretary, Mr. Bowman Macleod, 43, George Square, Edinburgh, will be happy to forward forms of application to gentlemen desirous of joining the Society.

GLEANINGS FROM SOCIETIES.

PAROTID CYST.

AT a recent meeting of the Pathological Society Mr. Bryant showed a cyst containing oil which had been removed from the parotid region of a girl aged nineteen. She had a very small growth at birth, which increased to the size of a flat walnut. It was translucent. During removal the sac ruptured, and discharged half an ounce of clear oil. The cyst was thin and smooth on the inner side. He found no record of such a case in the society's transactions. M. Guérin had lately described a case of congenital oily cyst near the ear in a woman aged thirty. Dr. Wilks had also recorded a case of fatty cyst of the pelvis. These growths, he thought, must be regarded as dermoid in origin.

SPINDLE-CELLED SARCOMA.

AT the same meeting Mr. Gay showed a specimen of a recurrent fibroid tumour of the mamma. In 1865, when the woman was sixteen years of age, he first removed the growth, which sprang from the fibrous tissue around the gland. Since then the tumour had, owing to its recurrence, been removed seven times.

ULCERATION OF THE TONGUE.

At the meeting of the Medical Society on the 17th ultimo, Mr. Jonathan Hutchinson read a paper on ulceration of the tongue. Reviewing the various names given to the different pathological conditions, he found especial fault with the term "mucous patch," or "plaque muqueuse," and challenged defence of the name "ichthyosis." Ichthyosis linguæ might exist as part of a general and congenital condition. The term psoriasis linguæ should only be used in cases in which it is associated with a general eruption. First among the causes of chronic glossitis must come, of course, syphilis ; but the tongue is also apt to be irritated by certain articles of food, by alcohol, drugs, tobacco smoke, by rough teeth, or by the teeth filled with amalgam, effervescing waters taken in excess ; also cheese and sugar were, in certain cases, of prejudicial influence. Among the most common results of irritation were wasting of the papillæ, and thickening of the basement membrane, denoted first by bald patches, and subsequently by bluish-white ones ; with these might be seen fissures or ulcers, as conditions of temporary aggravation. Mercury was well known as provocative of ulceration. All forms of disease of the tongue are much more frequent in men than in women ; and with the exception of sores produced by dental irritation, well-marked examples of leucomata in women were rare ; so also was cancer of the tongue rare with them. Red vulcanite, like any other irritant, might produce an initial inflammation. The ulcers occurring in association with indigestion constituted an important group, but he had not had time to refer to this. He did not differ much from Mr. Butlin, but objected to his application of the term "smooth tongue." He referred to the value of Mr. Fairlie Clarke's work upon the subject. He had seen but one case of epithelioma which took its origin in scar tissue ; it was rather the chronic inflammatory irritation that was the starting-point of Malignant disease.

Mr. Frank Mason agreed with Mr. Hutchinson's opinion, that many of those cases of white-patched tongue were not of syphilitic origin. He had seen white patches in the mouth produced by red vulcanite plates.

Mr. Bryant was of opinion that syphilis was the chief cause of the inflammation, but that not a few of the cases were marked by dyspeptic or some other troubles. He had known a case of chronic glossitis, with induration and infiltration, in a man who passed enormous quantities of lithic acid. The man had suffered from disease of the tongue for eighteen years, but he was a water drinker, and not a smoker.

SUICIDE OF AN L.D.S.Eng.

Early on Thursday morning, the 20th ult., an overcoat was found on the bank of the Thames, near the lasher at Iffley, Oxford. The police in the neighbourhood were communicated with, and P. C. Walters, with the assistance of Messrs. Reeves and Henwood, at once dragged the river. In about an hour the body of Mr. H. J. Virgin, Surgeon Dentist, of Sandfield House, Headington, was recovered. Several weights were found in deceased's pockets. The deceased had been strange in his manner for some time past, and had been carefully watched. His son was absent from the room a few minutes on Wednesday evening, and then Mr. Virgin left the house. A vigorous search was at once made, but without success.

Next day an inquest was held before W. W. Robinson, Esq., at the Prince of Wales, Iffley. Arthur Virgin, aged 19, son of the deceased, stated that his father had been suffering from melancholia for the last five or six months, and had been attended by Mr. Sankey, and arrangements had been made to send him to Northampton Asylum. His father had received a letter on Wednesday, informing him that he was to leave his residence. He had been in pecuniary difficulties, and a meeting of his creditors was called in the summer. He was a widower, and has left ten children. He had often said that he was tired of his life, and that the best thing would be for him to have a dose of poison. He went down to business a few days ago, but was not able to attend to it, nor had he been since the commencement of his illness.

Robert Jefferies, of Iffley Mill, proved finding the coat on Thursday morning. It was by the sluice gates. He did not hear anybody go over the bridge up to 6.30 a.m. He saw an envelope with the names of Messrs. Virgin and Bennett upon it, and he said to his wife, either Mr. Bennett or Mr. Virgin is in the water. He looked, but could not see anyone. About 7 o'clock he told Joseph Green, who at once went for a policeman. Constable Walters came and opened the letter, and they then made a search. On one spot he noticed a mark, which looked like a "V." There was another mark, but it was obliterated. He said, "V stands for Virgin." There were two footsteps leading from the wall to the letter "V." He then lent the policeman and two more men his drag and boat-hook, and they dragged until they found the body.

P.C. Walters said that he was sent for on Thursday morning, and arrived at the lock soon after 9 a.m. He was shown the overcoat, and where it was found. He found the letter, which was not sealed up, and he read it. The letter was dated May 29th. He made an examination, and found the letter "V" before mentioned. It looked as if it had been cut with a knife. There were also some footmarks. They were close to the water. He then procured drags and a boat, and, with the assistance of Reeves and Henwood, he found the body of deceased in about an hour. There was no hat anywhere about. He then brought the body to the "Prince of Wales," and, upon searching, he found in the right-hand coat pocket one 4 lb. weight, one 1 lb. weight, and a lead weight of about 1½ lbs. In the left-hand coat pocket he found two 2 lb. weights, and a pocket handkerchief, and four letters. In the other pockets he found one shilling and a German coin, a corkscrew, two knives, and a few other trifles.

Mr. Robinson then read a letter which required Mr. Virgin to leave his residence.

Mr. Thos. James Bennett, 20, Little Clarendon Street, partner of deceased, said he saw the deceased last alive ten days ago. In April last he was in pecuniary difficulties, and became much excited, and he asked him to put some poison in some medicine which the deceased was then taking. He considered that he was not master of his own actions.

P.C. Culverwell said he met the deceased the night he drowned himself, and he seemed quite master of himself then.

Verdict, "Suicide while of unsound mind."—*Oxford Chronicle.*

Mr. Virgin obtained the L.D.S.Eng. in 1864, and was elected a member of the Odontological Society in 1862.

DEATH OF A DENTIST FROM MORPHIA.

On September 22nd, Dr. Danford Thomas held an inquiry into the circumstances attending the death of Sustain (?) Rogers, aged forty-six, Dentist, of 115, Seven Sisters' Road, Holloway, who died suddenly on the Saturday previous.

Ann Rogers, the wife of the deceased, said that her husband had, since Christmas last, been suffering from a cancer within his mouth, and he had undergone the operation of removal of the tongue. He was unable to take anything but liquid food, and he suffered so much pain that he was in the habit of taking morphia to induce sleep. As he did not awake at the usual time on the morning of the day named, she sent for Dr. Berry, who arrived whilst he was still breathing; but all his efforts to arouse him were of no avail, and he expired shortly afterwards.

Mr. M. W. Berry said that he found behind the looking-glass four morphia powders, each containing two drachms of morphia, and the circumstances were such as to lead him to suppose that the deceased had taken two of the powders. A fourth of one of them would be sufficient to kill a man not accustomed to take morphia.

Mr. W. D. Slyman, surgeon, said that he had attended the deceased for the cancer of the tongue. He was a very courageous man, and had his tongue cut out without evincing the slightest terror, although he nearly died while under the operation. He used to take morphia powders, but not under his (Mr. Slyman's) directions, although they were necessary to get him to swallow any food. He did not believe the patient would take the morphia with the intention of putting an end to his life. There was no doubt he died from an overdose of the poison. In the ordinary course he must have died within three weeks from the effects of the cancer.

The jury returned a verdict of "Death from misadventure, caused by an overdose of morphia, taken to allay pain whilst suffering from cancer of the tongue."—*The Islington Gazette.*

NEW INVENTIONS.

THE REMORA.

A NEW SALIVA EJECTOR.

This instrument, the illustration of which is to be found on page 1 of the Advertisement Sheet, has been designed to furnish an efficient means of removing the saliva during operations on the teeth, where a fall of water is not at hand, or where it cannot be conveniently utilized.

To use the instrument, press down the knob seen on the top of the case, turn the handle in the direction shown by the arrow, until a check is felt, stop, and leave the handle in situ. Place the instrument behind the operating chair, either on the floor or on a low stool, at such a height as may be most convenient to the operator, with "the handle towards him." Pull up the knob and apply the mouthpiece to the mouth. If there be a copious flow of saliva, the knob may be pressed down, after the saliva has been drawn over for a minute or less, and the instrument will still do its work. If the quantity of saliva be small, the knob should not be pressed down, an occasional single turn of the handle will then maintain the moving power for hours. At the end of the day, the tap or screw at the side should be turned to let out the condensed moisture, care being taken to see that it is properly closed before the instrument is used. The Dental Manufacturing Company are sole agents for the United Kingdom.

AN INJECTOR PRESS.

By Joseph Duchesne (Marseilles).

From "Le Progrès Dentaire," May, 1881.

This apparatus, which is illustrated on page 2 of our Advertisement Sheet, dispenses with all such operations as cutting or trimming of the vulcanite, heating of boiler, filling, re-heating, smoothing off the seams, placing inside boiler, tightening down, &c. Besides, the case is turned out without thickening, or excess of india-rubber, while there is no danger of the teeth, clasps, or plates coming off, subsiding, or twisting the wrong way.

The new boiler, turning as it does upon its axis, admits, without its being taken off or allowed to cool, of making one and the same case with pink, white, brown, or black rubber, according as the case may be required to have a cup of black base lined pink, and with pink gums.

Over every other apparatus in use at this day, it possesses the immense advantage of opening to allow the operator to ascertain whether the injection is sufficient, and of cooling down instantaneously, so as to afford a chance of finishing off the case with utmost despatch when time is in consideration.

In the event of celluloid being used, the same manipulation will apply, with the like advantages—a great saving, and the certainty that it will run properly in every direction, without interfering with the position of the teeth, and without leaving any thickening.

Repairs can be executed with the greatest ease, and without leaving any trace of piecing together, which has hitherto rendered the use of celluloid extremely inconvenient.

Lastly, in this apparatus it will be possible to heat in the same boiler, and at the same time, a case of vulcanite and one of celluloid, without requiring to open or allow it to cool. Cleanliness, perfect certainty in the execution of any piece of work, no failures, saving of time and money: such are the positive advantages claimed for this apparatus.

To use the apparatus, place the boiler A on the swivel stand B. The boiler is immediately pressed by the buffer-plug F and the screw E, fitted with a fly-wheel. Underneath the boiler A should be stood the spirit lamp N, which will raise the temperature to 120 deg. centigrade. Then introduce the rubber or the celluloid through the injector tube J, screwed on to the boiler. The injection is effected by means of the screw I, fitted with a piston, which enters the injector tube J, driving in the celluloid by a gentle and continuous pressure, obtained from the fly-wheel G. When the substance inside the injector tube J has been completely driven home, and the screw has fully reached the end of the tube, the injected substance, if in excess, will run out through three small overflow apertures, situate in the circumference of the moveable portion of the boiler A.

If the overflow matter from its appearance should give rise to doubts as to the complete fusion of the injected substances, the operator can easily open the boiler to ascertain whether the process is not going on satisfactorily (a very rare occurrence indeed), and then re-arrange the apparatus as before. Then introduce a small quantity of fresh substance through the tube, and when the boiler has once more reached the temperature of 120 deg. centigrade, apply the pressure, whereupon the operation will be found to have perfectly succeeded, without revealing the slightest trace of jointing. For india-rubber injections, 80 or even 60 degrees centigrade will be a temperature quite high enough.

If the injected case be of celluloid, the boiler may at once be stood in cold water, so as to complete the work without further delay; though it would perhaps be preferable to let it cool gradually, in the ordinary way, before finishing off the case.

If, on the other hand, the operator is making use of vulcanite, let him deal with the boiler in the usual way, and then proceed with the work of vulcanisation according to any plan he may like best.

It will be highly important, after the celluloid or the rubber has been heated to the requisite degree of temperature, and when it becomes necessary to cool the boiler, or change the injector for the purpose of introducing a fresh supply of substance, to unscrew the piston, with a view of preventing it from getting cold; for if any of the material still adhere to it, it would form a species of pasty slag, calculated to interfere with its proper working subsequently.

Any of the French or American celluloid bases can be used in this apparatus, without needing to be first formed to any particular shape. Moreover, any remnants, however small, may be utilised in the make of new cases.

If pieces be too large in relation to the bases required, the celluloid may always be softened in hot water, so as to admit of its introduction in the chamber of the injector.

When the wax is taken out of the boiler, it is of the highest importance, before softening the rubber or celluloid, to talc the plaster mould of the boiler with extreme care. The talc should be laid on with a brush, and then rubbed in with the finger, so as to obtain a glossy surface; then add a little oil—a very little only—so as to prevent the formation of air bubbles. This will facilitate the opening of the boiler, and cases will then turn out neatly finished, and handsome in appearance.

EXAMINATION PAPERS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Examination for Diploma in Dental Surgery, October 26, 1881:—

ANATOMY AND PHYSIOLOGY.

1. Describe the course and branches of the Internal Maxillary Artery.

2. Describe the functions of the Tongue, and the Nerves concerned in each.

SURGERY AND PATHOLOGY.

1. What do you understand by a "Ranula"? Give its symptoms, pathology, and treatment.

2. Give an account of the process of Healing (1) of a simple incised Wound; (2) of a lacerated and contused Wound.

DENTAL ANATOMY AND PHYSIOLOGY.

1. State the periods of eruption of the several Temporary Teeth. Into what groups do they, in this respect, admit of being divided? and what pauses occur in the process?

2. Describe the structures met with in a complete Vertical Section through the Sac of a developing Tooth at the period of commencing calcification.

3. Mention the various methods of Attachment of the Teeth to the Jaws. Give examples of each variety.

DENTAL SURGERY AND PATHOLOGY.

1. What are the most frequent causes of Death of the Pulp? By what structures are so-called dead Teeth in relation with surrounding living tissues? and what morbid conditions may lead to their ultimate loss?

2. State the conditions under which you would consider the following materials the most suitable for filling Teeth, viz.: gutta-percha, zinc oxychloride, zinc phosphate, and copper amalgam.

3. Describe the morbid appearances and ordinary causes of the different conditions known by the terms Gingivitis, Rigg's disease, and Blue gum.

OBITUARY.

ROBERT PRATT.

We have to record the death of Robert Pratt, late of Broad Street, Golden Square, which took place suddenly on the 10th ultimo, at the residence of his daughter, 175, Cold Harbour Lane, S.E. Mr. Pratt was for many years in business in Broad Street as a dealer in Dental materials, from which, through advancing infirmity, he withdrew a few years ago.

EDWARD BARTON BARTLETT, L.D.S.Eng.

Mr. Bartlett was a highly respected member of our profession, and practised for many years in the West End of London. He was born in 1813, was admitted a Licentiate in Dental Surgery of the Royal College of Surgeons of England in 1860, and he retired in 1874.

HENRY JAMES VIRGIN, L.D.S.Eng.

An account of the sad death of Mr. Virgin will be found on page 225.

LINTON ROYNON ROGERS.

A report of the coroner's inquest regarding the death of Mr. Rogers is given on page 226.

READING GENERAL DISPENSARY.

THE Reading Dispensary is a provident institution, rendering assistance to a large and increasing number of people of the provident working class, who pay a small monthly subscription.

The Dental Department is under the care of Mr. Geo. Lyddon, L.D.S.Eng., as hon. dental surgeon, through whose kindness this report is furnished.

The work of the department consists mainly of cases of extraction; and it may be interesting as well as useful to record the number of members entitled to attendance, and the actual number of attendances, as showing the relative number of cases arising from an ascertained number of persons.

Date	Number of Members.	Cases attended.
1876	10,953	341
1877	11,246	427
1878	12,185	488
1879	12,581	499
1880	13,161	543
	5)60,126	2,298
Average of five years	12,025.2	459.6

The result of five years' work, from 1871 to 1875, could be also given, but, as the figures for those years are not reliable, only a portion of the cases having been carefully registered, they are not included in this report.

DENTAL HOSPITAL REPORTS.

DENTAL HOSPITAL OF LONDON.

QUARTERLY REPORT OF CASES TREATED FROM JULY 1ST TO SEPTEMBER 30TH, 1881.

Extractions—Children under 14	1388
,, Adults	2483
,, Under Nitrous Oxide	961
Gold Stoppings	215
White Foil ditto	10
Plastic ditto	903
Irregularities of the Teeth	171
Miscellaneous Cases	620
Advice Cases	462
Total	7213

HERBERT G. BLACKMORE,
House Surgeon.

NATIONAL DENTAL HOSPITAL.

QUARTERLY STATEMENT OF OPERATIONS PERFORMED FROM JULY 1ST TO SEPTEMBER 30TH, 1881.

Number of Patients attended		3886
Extractions—Children under 14		1168
,, Adults		1825
,, Under Nitrous Oxide		334
Gold Stoppings		132
Sheets of Gold used independent of Pellets	94	
Other Stoppings		738
Advice and Scaling		359
Irregularities of the Teeth		89
Miscellaneous		536
Total		5181

JOHN S. AMOORE,
House Surgeon.

DENTAL HOSPITAL OF EXETER, BEDFORD CIRCUS.

QUARTERLY REPORT OF CASES, FROM JULY 1ST TO SEPTEMBER 30TH, 1881.

Extractions—Children under 14	284
,, Adults	695
,, Under Nitrous Oxide and Ether	40
Stoppings—With Gold	19
,, ,, White Foil	19
,, ,, Plastic Material	187
Miscellaneous—Irregularities of the Teeth, Scaling, &c.	196
Total	1440

HENRY B. MASON,
Hon. Sec.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

THOUGHTS—COMPARISONS—REFLECTIONS.

To the Editor of the DENTAL RECORD.

SIR,—Mr. Laws, in his reply, has taken an offensive personal view of my remarks, which I certainly did not intend to give any grounds for.

He referred to failures which I know only can occur with careless or improper treatment; and, knowing this, I referred, not personally to him, but to the cause of failure which all makers have to contend with—not myself alone, but every maker without exception.

Mr. Laws says I am always ready to entertain the readers of the DENTAL RECORD with a statement of my wrongs. So far as I can remember, I have never written a word previously for the DENTAL RECORD, and certainly I have not for many years written anything for *any* Dental periodical, except after repeated solicitations. I have no time for anything of the kind, and certainly have no "grievances to air."

He desires to know where my translucent filling is, which was "heralded," &c. It was not heralded with anything. Of the total sales up to the present date nearly one-half was sold before a single word was said or printed about it. It was sold privately, until some one (I believe the President) exhibited some specimens without my knowledge at a meeting of the Odontological Society. A circular was then of necessity printed embodying the statements of users.

As to where it is: it is now where it was—supplied to those few who know how to use it; and is, also as it was, the only filling I should use where seen. I saw last week a plug—the first I ever inserted—which is now perfect. Knowing the great difficulty in using it, I do not supply it to any except those who thoroughly understand it. If the difficulty of using can be overcome, which is yet possible, it will yet rank the first of all fillings.

Mr. Laws appears to think a well-inserted amalgam plug cannot be shaken loose by polishing. Before thinking anything, I should advise him to prove it by actual experiment. It is not a question of thinking, but of fact. Any further correspondence on this matter I must leave to Mr. Laws.

Yours. &c.,

Warrington, *Oct. 7th*, 1881. THOS. FLETCHER.

THE USE OF TITLES.

To the Editor of the DENTAL RECORD.

SIR,—Will you kindly insert the following in your valuable journal, with reply thereto, for the information of the profession. I am a registered Dentist, as the *Dental Register* proves. I have been in the profession for something like nineteen years. I called on a dentist of this town a few days ago. He asked me if I was a registered Dentist, and on my giving him a straightforward "Yes," he suddenly became, to all appearance, to have a jealous turn of mind, and assuming a high-handed tone, objected to the abbreviations on my card, and told me that he had authority (as a qualified Dentist of Ireland) to prosecute any Dentist registered as being in practice before July 22nd, 1878, who should use any other title than Surgeon Dentist, or Dental Surgeon. He threatened to prosecute any Dentist, registered as I am registered, should they use any "*abbreviations*" whatsoever. Will you please say if a Dentist registered as being "in practice before July 22nd, 1878, is entitled to use the abbreviations of L.D.S., R.C.S.Eng. or L.D.S. Eng.?"

Will you kindly, if possible, also state if the Dentist to whom I refer, and whose name and address I herein enclose, has any authority, as he states he has, and if so, what? I have been encouraged to write you because, in the first issue of your journal, you say that it shall be devoted to the interests of the profession. I remain, Sir, your obedient servant,

September 20th, 1881. A SOUTH AFRICAN DENTIST.

[A registered Dentist may use what abbreviations he pleases, providing he has a right to do so. But for him, or any one, to use the letters L.D.S.Eng., when he does not possess the license they imply, is punishable. The same applies to the false use of any other qualification. In such case a private individual may give information, and the person may be proceeded against for penalties by the corporation whose jurisdiction he may have infringed.—ED. D. R.]

Editorial.

CANDIDATE, TEACHER, EXAMINER.

The ability to instruct others is not found to be in exact ratio to the amount of knowledge possessed by a teacher. There is an art in teaching, for which some information on the subject taught is necessary. But apart from possessing the essential elements of successful teaching—as the tact of lucid expression, the plain representation of cause and effect, rather than a bare and dogmatic statement of conditions, without a word as to their relation to antecedent and collateral phenomena—, the teacher has to consider the immediate requirements of the student, whose goal is to pass the examination. And, while he points out the facts of the subject, and the chief land-marks of study, and conducts the pupil over a wider field of knowledge than the intended examination embraces, he has not to forget the whims and pet theories of examiners. These have to be ascertained by experience, and by the interrogation of passed and rejected candidates. It not infrequently transpires that the greater part of the allotted time of an examiner in *vivâ voce* examination has been taken up, not with a sagacious inquiry into the soundness of the candidate's knowledge and general ability in the subject, but rather in airing a theory which may, perhaps, have found publication only in the *Transactions* of some society, inaccessible to the ordinary student. A failure of conscientious duty such as this, or in any other manner which may tend to unbalance and confuse the mind of the candidate, is beyond excuse, and ought not to be known in connection with the important and responsible function of an examiner.

The written questions, too, are often very confusing, ambiguous, and ungrammatical. The following question, given at the Dental Examination, in April last, at the Royal College of Surgeons, Edinburgh, is an example of, as it proved to be at the time, not the most explicit form of arranging the subject of the query:—"Mention the relative position of parts found on dissection between the digastric muscle and the line of the lower jaw." The question is made equally comprehensive, and the meaning of it much more obvious, as—Describe the boundaries, the contents and their relations, of the sub-maxillary triangle.

At the recent Dental Examination at the Royal College of

Surgeons of England, this question was given:—"What are the most frequent causes of death of the pulp? By what structures are so-called dead teeth in relation with surrounding living tissues? and what morbid conditions may lead to their ultimate loss?" The first section of the sentence should, clearly, be—the *more* frequent causes. The second item of the question is too indefinite for us to venture giving its meaning. Other questions of the same group are open to criticism, as are also many of those which have been given by other Dental Licensing Bodies.

The appointing by the respective authorities of competent and conscientious examiners is of the first importance to the success of an examination being a test of knowledge. We shall not ask who examines the examiners? but there can be no question as to the truth of the statement that the most fitting qualification for an examiner is the practical experience gained by teaching pupils. We do not say that the several Boards of Dental Examiners are more open to criticism than other bodies of examiners, but the foregoing few remarks have their application.

GOSSIP.

We have already had some indications of the approach of the foggy season, and a correspondent of *Nature* not inopportunely writes upon the virtues of yellow glass in a fog. He says:—"Some years ago I was staying at an hotel on the Lake of Constance. One morning a fog came on which completely obscured the opposite shore, but looking through a strip of yellow glass, which formed the border of the window, I was able, to my surprise, to see it distinctly. I presume the yellow glass choked the blue rays reflected by the fog, just as Nicol's prism, held at the proper angle, chokes the rays reflected from the glass and enables us to see clearly the picture behind it. On my way home I stopped in Paris, and, happening to call on one of the principal opticians, mentioned the circumstances to him. He forthwith showed me a naval telescope provided with a cap at the eye end containing a yellow glass, which could be removed at pleasure. I should like to know if the same simple contrivance has ever been used in our own navy."

The Deputy-Master of the Mint estimates that out of the total gold coinage in circulation, amounting to about one hundred millions sterling, not less than 40 per cent. is light to a degree which renders the coins no longer legal tender. It is to be observed, however, that a sovereign reaches this point when it has lost three-quarters of a grain of its weight, worth about three halfpence. The estimated "life" of our sovereigns and half-sovereigns is about eighteen years. It appears that the Bank of England is accustomed to send light gold to the Mint for re-coinage at the rate of nearly one million per annum, and that the Deputy-Master considers a systematic re-coinage of our light gold has now become a matter of "some pressing necessity," and that the operation would be accomplished in about four years.

AT the recent meeting of the British Association, Dr. C. W. Siemens read an interesting paper on application of electric energy to horticultural and agricultural purposes. He detailed a series of experiments which he had made with the view of showing the influence of the electric light, and the application of the electric energy to farming operations. The most recent of these experiments were made between October last and May of the present year, the electric light being in operation from five to six p.m., until the dawn of day, every day except Sunday. The general result of these experiments was to show that the electric light was capable of producing on plants effects comparable to those of solar variation, and favourable to healthy growth. As to the theory of diurnal rest being necessary to plant-life, Dr. Siemens gave it as his opinion, as the result of his experiments, that, although periodic darkness evidently favoured the growth, continued stimulus of light appeared to promote the healthy development, and to accelerate the plant through its different stages of flower and fruit.

MR. NATHANIEL STEVENSON, M.R.C.S., L.D.S., writing to the *British Medical Journal*, says:—"The apparent indifference to professional dental education by some who occupy important office as members of the Medical Council is illustrated by the following facts:—One of the most prominent members of the Council not only employs a person whose sole qualification is registration, but also sends all patients needing dental assistance to him. Taking into consideration the eminent position in the Council, and professional status of this gentleman, one seems justified in concluding that in it there exists almost total indifference to the claims of education for our branch of the Profession. And, perhaps, that is the explanation of 'the extremely unsatisfactory condition in which the Medical Council left the question of a purgation of the *Dentists' Register*,' as stated in your journal of the 24th ultimo on that subject."

THE difficulty of soldering aluminium is, according to Lieut.-Col. Ross, due to the enormous heat-conducting powers of the metal, which transfers the heat from a blow-pipe flame so quickly away over the entire substance of a fragment of given bulk, that no one part of it can be raised to the fusing point; so that, although small portions of almost every other metal or alloy can be readily fused upon it, even the most fusible, such as antimony, bismuth, &c., cannot be made to combine with the aluminium.

THE milk of the elephant, according to Dr. Charles Doremus (America), contains less water and more butter and sugar than any other. It has a very agreeable taste and odour.

DR. KAISER, Germany, has lately described a simple process of nickel plating. He prepares a bath of pure granulated tin tartar and water, which he heats to the boiling point, and adds a small quantity of pure red-hot nickel oxide. A portion of the nickel is soon dissolved, as is shown by the green colour assumed by the liquid which stands upon the grains of tin. If articles of copper or brass are plunged into the bath, they become covered in a few minutes with a beautiful white, silvery, metallic coating, which consists almost entirely of pure nickel. If a little carbonate of tartrate of cobalt is added to the bath, a bluish shade, either light or dark, may be given to the coating, which becomes very brilliant when it is properly polished with chalk or dry sawdust.

AN Austrian chemist is said to have some time ago devised a new soporific, the action of which is so rapid and powerful that a few drops of it sprinkled on the head and face will effectually stupify a man in a few seconds and render him utterly defenceless. The name of *Bandiger*, or "tamer," was given to it, and he offered the secret of its preparation for sale to the Austrian Government. The Government not only refused to purchase it, but ordered the police authorities to formally notify the inventor to discontinue his experiments, and to abstain utterly from using in any way his invention, or communiating it to others, under pain of being criminally dealt with.

A SUGGESTION is, according to the *Chemist and Druggist*, under consideration among certain of the medical societies of London, that an amalgamation should be effected between them into a new society, to be called "The Royal Society of Medicine." That much economy of management and advantage in respect to publicity of first-class papers would be attained is obvious, but the fatal objection to the scheme is that the number of officers would be limited, and the chances of younger and of second-class men to obtain a hearing would be checked.

THE conversazione of the Students' Society of the National Dental Hospital and College, which was held on the 14th ultimo, was very successful. There were quite 200 gentlemen present, including many students of the sister school in Leicester Square. During the evening there was vocal and instrumental music, also an exhibition of novelties and improvements in dental appliances, by Messrs. Ash & Son, and by the Dental Manufacturing Company, and a display of microscopes and other objects of interest. There were likewise some mechanical demonstrations. In every respect the evening was a very enjoyable one.

A MEETING was held at Norwich on Wednesday, the 5th October, when it was determined to form a Dental Association for the Eastern Counties, embracing Norfolk, Suffolk, Essex, Cambridgeshire, Northamptonshire, Huntingdonshire, Bedfordshire, and Hertfordshire. The majority of these counties being duly represented at the meeting, the necessary bye-laws were agreed to, and officers and provisional committee duly appointed. The first annual meeting is arranged to be held in April next. Mr. William Stringfield, Lowestoft, is hon. sec.

THE *Practicien* gives the following table as showing the proportion between physicians and population in the countries named :—

	Per Million.
Austria	610
England	600
France	291
Germany	321
Italy	610
Switzerland	706
United States	1,624

DR. DUDGEON, London, has recently introduced a new sphygmograph. It is of small size, 2½ by 2 inches, and 4 ozs. weight, therefore suitable for the pocket. It can be adjusted to the wrist with ease and rapidity, one elastic strap being sufficient to fix it. The instrument can be applied when the patient is either sitting, standing, or lying, and it is said to magnify the movements of the artery fifty times.

M. THURY stretched a copper wire horizontally between two houses, at the height of the roofs, and connected it with the water pipes, and with two telephones. At the same instant as a flash of lightning was seen the telephones gave characteristic sounds, similar to the sound produced when a Swedish match is rubbed upon the match-box.

CELLULOID may be used for preserving typographical *clichés* and stereotypes. The process consists in taking an impression of the engraved block by means of a special cement, which hardens quickly. After about twenty minutes the cement can support a pressure of 250 kilograms. Celluloid in sheet is used to take the counter impression from which to print.

CAPT. BELKNAP, of the U. S. steamer "Alaska," reports that, at a distance of 102 miles from shore, he found the depth of the South Pacific Ocean to be 3,368 fathoms, or nearly 4 statute miles. The cylinder brought up clay and greenish sand, and the bottom temperature was 34·2 degrees Farenheit.

THE Odontological Society will hold the first meeting of the session on Monday, November 7th, at 8 p.m. A paper will be read on "Caries of the Teeth in relation to Food and Feeding," by Dr. Richardson, F.R.S., and an "Odontome," recently removed by Mr. Christopher Heath, F.R.C.S., will be shown.

THE annual dinner of the staff, old, and present students of the National Dental Hospital and College, will be held on Wednesday, November 16th, at the Guildhall Tavern, Gresham Street, City. Mr. S. Lee Rymer is to preside.

IT is proposed to open an International Electrical Exhibition at the Crystal Palace in December.

Macmillan & Co. have made arrangements for publishing in England a new work on Surgery, "The International Encyclopædia of Surgery," in six volumes. Vol. V. will contain an article on injuries and diseases of the teeth: including fractures; hæmorrhage after extraction; toothache; odontomes; dentigerous cysts; extraction of teeth; caries, prevention and treatment; principles of mechanical dentistry; casts; &c. By Norman W. Kingsley, M.D.S., D.D.S., New York.

At the last quarterly court of directors of the Society for Relief of Widows and Orphans of Medical Men, the death of one widow was reported, who had been in receipt of grants from the society since 1833. The husband had been a member for nine years, and paid only eighteen guineas; but the widow and children had received the large sum of £2,272.

Dr. C. Creighton stated, before the Section of the Medical Congress on State Medicine, that it is on the morphological resemblance of the tubercular formations in the human body, and the characteristic bovine tubercles, he grounds his belief that the tubercular disease of animals which supply milk and meat for human use is communicated by such food to man.

Two cases of poisoning by carbolic acid are recorded in the *Nordiskt Mediciniskt Arkiv*. In the one case (a patient, under six months old) one per cent. carbolised oil was used as a dressing to a wound; and in the other (a child, one year of age) the acid was one in ten of the oil. In each case there was vomiting and dark coloured urine. The first child recovered, but the second one died.

The *Index Medicus* shows that during last year 11,700 members of the Medical Profession contributed something to medical literature. It would be interesting to know the number of writers in the field of Dental literature during the same period. The ratio would be lamentably small.

A system of supplying steam to towns, through high and low pressure mains, for heating, cooking, and engines, has recently been patented by Mr. B. Holly, of Lockport, New York.

In parotitis, Dr. Groner believes that the early use of a sufficiently large dose of the fluid extract of jaborandi, so as to cause considerable diophoresis and ptyalism, in most cases acts as a specific.

The parasitical character of tuberculosis has been experimentally established by M. H. Toussaint. He has collected the microbia of the disease, and cultivated them artificially.

The mineral statistics of Victoria show that the yield of gold for 1880 exceeds that of 1879 by 70,173 ounces. The total yield of silver for the year was 23,248 ounces.

It is stated that Prof. Guthrie has succeeded in producing a blue-black protective skin or coating on polished steel by dipping it in fused nitrate of potash. The "bloom" improves the appearance of the metal, and the coating is said to wear well.

It has been stated in a German paper that during the session of the International Medical Congress, and consequent temporary absence of the most eminent medical men, the mortality of Germany was diminished.

The preservation of articles of diet with salicylic acid has lately been forbidden by the French Government, this substance, when used in the quantity required to prevent decomposition being considered dangerous to health.

Prof. Frankland has analysed the water of the Holy Well of Zemzem, at Mecca, and he considers it is sewage more than seven times as rich as the average sewage of London.

John Gyumbere, a Hungarian, has been in a trance for 169 days, but he has now sufficiently rallied to give the story of his life and experience.

It is said that a Dental Depôt has recently been opened in Auckland, New Zealand, by Mr. John R. Gray.

The use of the arsenical water of the Court St. Etienne has been successfully tried in sea sickness by Dr. Barkany.

It is said that the sense of smell may be made, for the time being, more acute by filling the mouth with very cold water.

Dr. F. P. Atkinson writes in the *Practitioner* upon the local use of nitrite of amyl and of nitro-glycerine in tooth-ache.

Last year 10,064 persons died in Bengal from snake bites.

Communications.

Communications have been received from John A. Gartley, London; W. Bowman Macleod, Edinburgh; Geo. Lyddon, Reading; A. J. Prager, London; W. H. Hope, Wellingboro'; George Ward, London; W. V. Ditcham, Blackheath; W. Stringfield, Lowestoft; G. W. Parkinson, London; John Laws, Weymouth; Thomas Fletcher, Warrington; H. Browne Mason, Exeter; A South African Dentist; W. Whitehouse, London; Wm. Geekie, Oxford; &c.

Books, &c., Received.

"British Journal of Dental Science." "Journal of the British Dental Association." "Dental Register." "Dental Cosmos." "Oxford Chronicle." "Islington Gazette." "Circulaire l'École & de l'Hopital Dentaire Libres de Paris." "L'Odontologie." "El Progreso Dental de la Habana;" "Wakefield and West Riding Herald;" &c.

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ON RE-INSERTION OF TEETH.

BY J. S. COBB, L.D.S.Eng.

JUST as in nature many streams re-enter the earth, and force their way out repeatedly before attaining the dignity of rivers, so any departure from the recognised treatment of disease has to struggle against the *vis inertiæ* of received ideas, and is likely to be more than once forgotten before it is accepted. Indeed, to careful readers of scientific journals, it is curious to note the frequent recurrence of some statement or idea which, attracting more or less attention on its first appearance, forthwith subsides into apparent oblivion, till, after the lapse of a longer or shorter period, it re-appears—often with an ingenuous air of novelty about it—and is once more discussed and dismissed, to crop up again in due course, and be finally adjudged its position.

This appears to me to be especially so with the re-insertion of teeth —I use the term re-insertion as including both trans- and re-plantation. Transplantation would appear to be a process of some antiquity; whether it was ever practised by the Ancient Egyptians we have no means of ascertaining, but we have an account of the operation having been performed at least three centuries ago. The first recorded case of transplantation is, I believe, that referred to by Ambrose Paré, in which the loss of a tooth in a lady of quality was made good by the transplantation of one from the mouth of her waiting maid. Paré's work was published in 1579. It is not until some two hundred years later (in 1778) that we find John Hunter strongly advising the pursuance of the same operation. That this advice was followed to some extent there is reason to believe, but the transference of disease with the transplanted teeth led shortly to its abandonment, and in the early part of the present century transplantion was only mentioned in the schools to be condemned.

In 1859, Mr. Harding recorded in the *Lancet*, of July 9th, a case of replantation of a tooth, which was successful; and although doubtless not the first case—I myself having had several cases prior to that time

—yet it is the first case of the kind I remember to have seen recorded Then the subject, as far as any public mention of it goes, again lay dormant for nearly a dozen years, till in 1870 Mr. Coleman, in a paper read before the Odontological Society, drew the attention of the meeting to the subject of re-plantation, advocating it in cases of peridontitis, &c.

His views were supported by Mr. Vidler, who also related his own experience on the subject; neither gentleman being able, however, to boast of more than moderate success.

Three years later Mr. I. J. Lyons, in the *Lancet*, recommends re-plantation in necrosis and exostosis; and, in a very concise and lucid paper, details his process, and gives the result of his cases, success favouring him in nine cases out of twelve, a very great improvement on preceding averages.

In March, 1879, Mr. C. S. Tomes read, at a meeting of the Odontological Society, an epitome of Dr. Magitot's paper on the same subject, in which a still higher average has been obtained—viz., five failures only out of 63 cases.

Dr. Magitot, in a paper recently read before the International Medical Congress, claims success in 92 cases in a hundred.

Dr. Finley Thompson, at the same meeting, corroborates Dr. Magitot to some extent, but is more guarded in his statements.

I am inclined to doubt, however, if the operation will ever be extensively practised; the timidity of patients, the slight uncertainty, even at the best, as to the cases proving successful, the question whether cases of peridontitis cannot be as effectually treated in the long run by ordinary remedial means as by re-plantation, and, finally, the possibility of absorption of the roots of the re-planted teeth, all militate against it. Mr. Lyons, while restricting the operation to cases of exostosis and necrosis, admits the eventual supervention of absorption. Dr. Magitot denies the liability, but we have sufficient evidence of its existence in some of the re-planted teeth subsequently extracted. Then, while it is certain that teeth affected with peridontitis may in the usual way be made fairly comfortable and retained for a long time by treament, it is by no means as certain that the same teeth extracted and re-planted would not be lost in a few years by absorption.

As far as those cases are concerned, where from some cause it has been necessary to extract teeth with healthy periosteum, or where teeth have been extracted by accident, I am convinced that re-plantation offers a safe and certain method of saving them.

I use the expression "convinced," because I have had, both in my own person and in my private practice, sufficient evidence of the utility of the operation in such cases.

In 1847, when I was a student in Paris, I happened to be suffering pain in a lower second bicuspid, and was persuaded by a fellow student* to commence my practice on myself with the not-much-to-be-wondered-at result, that the instrument slipped, and while its unoffending neighbour was hoisted out the *fons et origo mali* remained untouched, and, if possible, more aggressively painful than before, until a second assault had ended more successfully. The first (and sound) bicuspid I returned to its socket and bit it down. It gave me no pain at the time, and in two or three days was perfectly firm, and still continues at the present day a useful member of my Dental apparatus.

So much for my personal experience. In 1854, July 25, a patient called on me suffering pain in one of the lower centrals, which he wished extracted; but as the tooth showed no signs of caries, and was not sensitive to the touch, I induced him to try remedial measures for a few days, at the end of which he insisted on losing the tooth, the pain in which was, he said, continuous. When extracted there was no unhealthy appearance in the periosteum, and I induced him by relating my own experience to have it replaced. I saw him frequently for several years, but he had no return of the pain or uneasiness in the tooth.

In the spring of the following year a married woman requested me to take out an upper lateral slightly decayed, refusing to have it stopped, on the grounds that stopping did not answer in her case, and that she invariably lost a tooth prior to each confinement. I, somewhat against her wish, re-inserted her tooth after extraction. Two years later she had occasion to see me about another tooth, when she said she had never had any further trouble with the lateral.

During the next fourteen years only some five or six opportunities occurred for re-insertion, but they were all very satisfactory in result. Only in one case had I any trouble, and that was with a patient, a maid-servant, from whom I extracted an upper bicuspid, the fangs of which were too divergent to permit their re-insertion, and which, believing at that time that any interference with the periosteum would be fatal to success, I abstained from replacing. After Mr. Coleman's paper was published in 1870 I tried his method in several cases of peridontitis, but with very unsatisfactory results. Perhaps, as I invariably grooved the tooth for drainage from neck to apex, and as I see Dr. Magitot insists on a perfect healthy ring of periosteum being left, that may account for my want of success. But I would ask, are we all agreed as to what is a successful case? Looking over a friend's case-book some time since I came upon the following annotations: "successful," "very successful," "most successful." Might not another practitioner have considered the two first *un*successful?

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* I met this gentleman, Dr. C. Smith, a few years since in Paris, where he now practises. We had not met for over 25 years, yet we had barely exchanged cordial greetings before he asked me about *that* tooth.

SOME REMARKS ON ADHESIVE GOLD FILLING.

By W. J. Pidgeon, L.D.S.Eng.

Perhaps the commonest complaint heard against adhesive gold-filling is, "that it takes up so much time and over-tires the patient," and no doubt, this form of stopping, when properly performed, is a comparatively slow operation. It must also be admitted that it is apt in many cases to be very fatiguing and disagreeable to the patient, partly from the unavoidable constraint of bodily position, and partly to the inability to relieve the mouth and throat by closing the jaws or swallowing the saliva at intervals, effects which are aggravated in the case of sensitive teeth, by the painfulness of the act of plugging.

And yet, notwithstanding these drawbacks to the form of work, and notwithstanding all changes of fashion, interest, or prejudice, there appears to be no sufficient grounds at present for believing that any of its existing rivals, though they may abate its too-proud pretensions, will succeed in shutting it out of its fair place in the field.

The fickleness of fashion is proverbial, and when she interferes, as she is so fond of doing, with the honest old clock of public opinion, she sets the pendulum swinging so violently as to interfere considerably with that steadiness so characteristic of stability. From one side to the other, with deceptive force, flies the pendulum, and it is some time before it can be perceived that it is slackening its speed and gradually losing its first extreme fluctuation, to settle down at last to such a sensible practicable pace as may, in the long run, be expected from this ancient critic of all things. Just now the pendulum of opinion on the subject of adhesive gold filling is swaying sufficiently to cause a suspicion of the permanence of its present indications. As long as we hear of prominent dentists who profess not to use this form of gold at all, and of others equally prominent who never use any other, we may be sure we have not yet arrived at that "happy medium" which Cowper praises so highly.

The fact of a thing being attacked is fortunately no proof of its unworthiness; it may serve in the end as a means of proving its true value.

For a time it was apparently the belief of many influential operators that the adhesive form of gold would quite put the non-adhesive *hors de combat*, and their opinion, of course, had great influence in gaining general respect for their favourite material, even unjustly, at the expense of the reputation of non-adhesive work.

Yet the inevitable reaction must arrive, and perhaps by and by it may become the fashion that the latter, in its turn, should be over-praised. It is not many years ago that the use of amalgam was so violently attacked that for a dentist to even admit that he used it was sufficient to condemn him in the eyes of certain American circles. Yet to-day amalgam has an acknowledged and stable place among our stopping materials. The very violence of the attack made upon it was in itself suspicious, and it expended its strength in its own fury. For the final verdict on the position of adhesive gold as a filling material we can only wait on Time, who proves all things.

Meanwhile, it behoves those who believe in the value of adhesive gold, and think it, like non-adhesive gold, bone fillings, tin, gutta-percha, and amalgam, inestimable when used at the right time, and in the right place, to take every means, however small, which may add to their success in its use, and assist in overcoming its difficulties and disadvantages. One difficulty that it has, in common with non-adhesive gold, which seems likely rather to grow than to decrease, as bone fillings improve in durability and colour, is the use of it in prominent positions in front teeth, where it becomes glaringly visible. Though fashion may support this use of it for a time, it will probably have to give place in such situations to its rivals, phosphate of zinc and gutta-percha.

As regards the constraint of the patient's position during filling, we can only diminish this by the use of commodious chairs, and by preferring rather to cramp our own position somewhat than add to the distress of the client.

The discomfort of the dribbling saliva should always be obviated by the use of some form of saliva-pump, the best kind being one fixed to the wall, and connected with a fall of water from a cistern, fixed at some considerable height to gain the required force of suction.

All possible preparations should be made before putting on the rubber-dam, in order to diminish as far as practicable the time of wearing this universally obnoxious arrangement.

The speed of packing a cavity may be diminished by various means, some of which are of greater efficacy and importance than others, but all of them worthy of consideration at a time when to the "*malheureux*" in the chair every moment seems to linger.

The use of the Dental Engine is supposed as a *sine quâ non*. The points which can least bear to be hurried are the shaping and polishing of the edges of the cavity, and the impacting the gold to the walls and to these edges, so that the borders of the plug may be rendered clean-finished, and without any sign of feather edge.

In pulpless teeth time need not be wasted in filling the nerve canals with the metal, as a cement filling is all that is required, except in those cases where the extension of the gold into the roots is necessary for anchorage. Neither need we in all cases form the whole plug of adhesive gold, even though the cavity is of such a form that it is requisite to use it for the surface.

Whenever the cavity is sufficiently deep, phosphate of zinc is much more serviceable on its floor than any metal could be, on account of its lower power of conductivity. It is also much better to fill up all undercuts that are not absolutely necessary as retaining points with the same material. This is much sounder practice than the plan of straightening the walls by sacrificing a portion of good enamel. Yet as the phosphate is not to be relied upon for the main retaining points or grooves, care must be taken that, after the introduction of this substance, the cavity is still of such depth and form as to admit of the firm retention of the gold. Where this cannot be arrived at, it serves better to substitute for the cement non-adhesive gold, in which, by wedging, efficient retaining-points may be gained. I do not care myself to hasten the work by the use of adhesive pellets, as I have not succeeded in obtaining with them an efficient degree of adhesion and solidity. They never seem to me to go down kindly under the instrument.

In large molar cavities the central parts of fillings may be speedily and solidly made up by the use of long strips of gold impacted with the engine-mallet. After cutting a sheet of No. 4 gold into four strips, each strip is lightly twisted and annealed. One end of it is then placed upon the adhesive metal already condensed, and the whole length rapidly worked in. I first saw this method used by Dr. St. George Elliott, who placed the gold in a warm glass tube, and so guided it to the plugger. I find that it saves time to dispense with the tube, and leave the strip quite free, merely doubling it with the plugger from one side of the cavity to the other, previous to condensing; and, after that portion is packed, doubling the free end across again, and so proceeding till the whole strip is finished. When it becomes necessary to pack smaller pieces time may be saved by adopting a quick mode of annealing the gold and carrying it to the cavity. It is not necessary that each portion should be softened *immediately* before its insertion. Some dozen or more I find it quite safe to anneal at a time, and place on the pad ready for packing.

With regard to the manner of carrying these prepared pieces to their place in the tooth—if working without an assistant—one should acquire the habit of picking up each piece with the point of the instrument with which it is actually to be impacted (which is easy if the pad be made of soft amadou or velvet), instead of using the tweezers, as some do, thus losing time in taking up and putting down this auxiliary, if not the plugger or mallet as well, before each fresh portion is added.

When the retaining points of a plug have been filled, and there is not yet sufficient gold inserted to allow of the use of any form of mallet, a form of heavy hand pluggers will be found very useful, as they are capable of quickly giving the requisite density without any risk of the jarring so apt to occur at this juncture, when anything but hand pressure is applied. These instruments should be held lightly in hand, and used partly on the principle of a battering ram, which does its work by the saving of its own weight. They are equally good also for malleting or hand pressure. To me the two most useful forms are an instrument with a spiral point, and a fellow with its tip turned to the opposite side. These are exceedingly useful, used either with or without the hand-mallet, especially for packing awkward points of interstitial cavities in front teeth. They are made of metal throughout, and have small, circular, corrugated, flat, working surfaces.

Lastly, to consider the comfort of the operator himself, who may, perhaps, be allowed to have some feelings of his own, however secondary he may make them to those of his patient; it will well repay any busy practitioner in saving of time and energy, and even in improving the quality of his work, to put aside an incommodious old-fashioned chair, in favour of one of the recent forms, which will enable him to do his work with much less strain and discomfort. The broad respectable-looking old chair may be soft and easy enough for the patient, yet it won't in the long run be as good as a modern one for his comfort, either in tooth or in pocket, if, meanwhile, it is breaking the back of the man whose work he relies upon. With a well-adapted chair, and the use of an operating stool, at times of fatigue, we may improve both the speed and the quality of our work; so that these also may serve as a means of diminishing the difficulties of adhesive-gold fillings, and of rendering them more generally practicable.

THE PROFESSION AS IT IS.

By M.R.C.S., L.D.S.Eng.

At no period of its history has our profession had a more healthy or brighter prospect than at the present time. This encouraging state of affairs is owing in a great measure to the unceasing labour and untiring energy of some of our senior and leading members. I am afraid that the rising generation of dentists fail, as a rule, to appreciate the efforts that have been made, and the good which has been done, for their welfare and the development of our art.

Let us then compare the position of our profession in the time of our grandfathers, fifty or sixty years ago, to the present position which we have now reached, since it is by comparison only that we are able to realise and appreciate what the profession now is. What opportunities had our forefathers of learning their profession? They were entirely dependent on their own resources, and when anyone comes across the work executed in those days it is wonderful to think how it was accomplished; but in comparison with the work of to-day it would stand at a low ebb, though even now it would put to the blush some of our would-be dentists. Young men entering the profession at the present time do so with a feeling of assurance, and a knowledge of its stability, which during their studies help them a long way on the road, and encourage them in endeavouring to attain the highest step of the ladder which leads to fame. Dentistry is now a profession—a distinct and important branch of general surgery, recognised and legalised by the State, and permanently strengthened by the various Colleges of Surgeons of the United Kingdom granting special diplomas which give the fortunate possessor of the same powers to follow his calling in an honourable, legal, and scientific manner. Our art is a true speciality in the strictest sense of the word, and it is also a distinct profession. No one nowadays ought to be recognised as a dentist unless he be duly qualified, and I wish it plainly to be understood that it is an erroneous act for a surgeon or physician, or in fact anyone not possessing our special license, to call himself a dentist and act as such. Years ago a medical man who had failed at his profession, or, for other reasons, because he could extract a tooth with tolerable skill, and stuff some plastic material into the cavity of a carious tooth, might with perfect right call himself a dentist, for in those days extraction was almost the universal cure for toothache, and no other knowledge was necessary or expected; but this is all changed. Harsh and unkind as it may appear, it is nevertheless a fact that a medical man, not possessing the special license, setting up as a dentist at the present day, puts himself on a level with the charlatan or the self-made dentist, whose disgusting and lying advertisements daily find place in our public journals, and infest our thoroughfares, with their obnoxious presence, and whose existence the law is unfortunately just at present unable to cope with. Of course, we all know there are several esteemed members of the medical profession skilfully and honourably practising our speciality, these gentlemen having gained their knowledge and skill in a then perfectly legitimate and the only way. But now all is different; a man has to attend a general hospital two years, and the special one for a similar period, during which time he is attending lectures and gaining practical knowledge which, at the end of his time, will enable him after careful study to pass the necessary examination for his special diploma, and to launch himself on the world "a dentist." I have heard our diploma laughed and sneered at as an utter failure so far as testing a man's knowledge goes, but all I can say to these individuals is, let them present themselves before the Dental Examining Board of the Royal College of Surgeons of England (I have no knowledge of other colleges) and if they are not well up to the mark, both theoretically and practically, they will find themselves in a very ungenial atmosphere; for they will see things and be asked questions of which they have never heard, but a knowledge of which is absolutely necessary for a man who intends practising our art, and without which he would find his professional path strewed with difficulty and regret. If this diploma is not what it is represented to be, does anyone imagine that the men who compose our examining board would put their honoured and valued names to a diploma which is worthless and untrue? The idea is preposterous, and may be dismissed with ignominy. It is not my object even to hint that it is not necessary to take a general qualification in addition to the special one. By all means let those who have the power avail themselves of it, and the more the better, for knowledge thus gained will always be of the utmost value, both socially and professionally; but in the possession of these degrees don't let anyone for a moment imagine himself professionally superior to a fellow practitioner who only possesses the L.D.S., because, as far as our speciality goes, we are on an equality.

To sum up these remarks, we stand to-day in the enviable position of a legally-recognised profession whose future motto should be "Excelsior;" and young men entering our ranks should not forget those who have devoted time, money, and health for the welfare and advancement of our art, but should emulate their example, and by true, honest, and *bonâ fide* work strive to elevate our profession to a still higher pinnacle.

CASE OF REFLEX PAIN.

By J. R. Gurner, L.D.S.Eng., Adelaide, S.A.

A few days ago a young woman came to me with acute pain in the right inferior bicuspid and molar, both carious and very sensitive to the touch. The bicuspid being the more painful of the two, I extracted it. Immediately on its removal, she convulsively clasped her right arm, exclaiming, "Oh, my arm! my arm!"

For ten minutes she writhed in a perfect agony of pain, alternately rubbing, and violently extending, the limb. The paroxysm having somewhat abated, she informed me that during the present attack of toothache she had suffered more or less brachial neuralgia, but nothing to compare with her suffering then, which, she assured me, was worse than any pain in the teeth she had ever experienced. When she left my house, after twenty minutes' stay, the irritation continued unrelieved.

Her mother, who accompanied her, told me that many years ago she herself was similarly affected after the extraction of a lower molar.

BOOK REVIEW.

Manual of Dental Surgery and Pathology. By Alfred Coleman, F.R.C.P., &c. London: Smith, Elder, and Co.

(*Continued from page* 202.)

Dental Caries is a disease which has been observed in many orders of mammalia; and it is also accepted that as animals have become subjected to domestication, and, in the case of man, to civilisation, has caries of the teeth become more prevalent. "There is," Mr. Coleman writes, "probably no disease so common to the civilised portion of the human race in the present day as dental caries; so much so, that it is rare to find a mouth in which some manifestation of its ravages is not present, or an individual so fortunate as to have never experienced the pain which accompanies it." "One of the chief causes of this degeneracy we believe to be the change, both in character and mode of preparation, which the food of man has undergone during the last few centuries." In support of this latter opinion our author sets forth that uncivilised or primitive man ate hard baked bread, made of coarsely ground grain, containing a large proportion of the husk and phosphates; the flesh of animals was cooked, not when tender and on the eve of putrefaction, but soon after the death of the victim. The meat was torn from the bone by the grasp of the incisors and canines, and the bread eaten only by the aid of good teeth and powerful jaws. The necessary function of the dental apparatus (teeth, gums, jaws, muscles) efficiently exercised in this manner, begat or maintained a corresponding efficiency of structure, in accordance with the biological law that function begets structure, and structure function, and each reacts upon the other. In our day, among the conditions of civilisation, is to be observed a very material physical (in contradistinction to psychological) retrograde development, and this, beyond doubt, is the result of the converse working of the law just stated. To these more abstract effects of morphological and physiological development, Mr. Coleman justly adds the preservation of the weak and feeble, and they eventually bringing forth the puny and debilitated—for grapes are not the fruit of thistles; also the depressing effects due to over-exertion of mental and nervous energies, &c. This chapter on dental caries is, considering the extent of the literature upon the subject, and its importance, one of the more concise and interesting of the twenty-one chapters of which the work consists.

Devoted to the Treatment of Dental Caries are 170 pages. These are largely taken up with illustrations, many of them most useful and instructive, but almost an equal number, including those of a chair, stand, bracket, &c., are more fitted for a dealer's catalogue.

The next two chapters deal with Periodontitis, Alveolar Abscess, Dental Necrosis, Absorption, and Exostosis. Regarding Necrosis, the term is respectively applied to the death of the pulp and to death of the cementum. According to this, by Necrosis of a tooth is meant the death of either the pulp or cementum. This is indefinite and objectionable. It is within the experience of most Dental practitioners that a pulp may be removed from a tooth and yet the member remain for years firm and useful, and present no difference from its normal neighbours. Cases are also recorded where, though the pulp has been removed, the dentine still retained its vitality—its sensitiveness. In necrosis (of bone) the dead bone is exfoliated, but sequestration does not necessarily occur to a tooth without a pulp. In these respects, as well as etymologically, does the term "necrosis," as applied to a pulpless tooth, indifferently, if at all, express any of the conditions of dead bone, or of its relations to surrounding structures. But, on the other hand, with death of the cementum there is death of the tooth tissue which most nearly simulates bone, there is also a discharge of pus, and sequestration of the tooth—three conditions which characterise true necrosis, or death of bone. Surely, then, it would be much more exact to speak of the death of the pulp of a tooth as such; and to regard necrosis of a tooth as that condition in which the cementum is dead.

The following three chapters are devoted to the "Extraction of Teeth"; the other subjects treated being Anæsthetics, Replantation and Transplantation, Diseases of Gums and Jaws, and Nervous and muscular Affections dependent upon Dental Irritation.

Perhaps our criticism of this book has, in some measure, been severe; but, if so, those observations were written in the best faith, and as an outcome of true feeling and a sense of duty.

The work which Mr. Coleman has now produced is a welcome addition to Dental literature, and will, we are sure, be read and received with much satisfaction by the practitioner, while the student will hail it as an almost indispensable help in his study of Dental Surgery.

REVIEW OF THE PROGRESS OF ODONTOLOGY.

(*From the* SPECIALIST.)

FOREMOST amongst the events in connection with this speciality stands the recognition of it as a branch of medicine and surgery—first by having a special section assigned to it at the meeting of the International Medical Congress in August last, and, secondly, by its finding a place in this journal. We trust that it may not be long before it has a special place in the meetings of the British Medical Association, who only this year have given Otology a sub-section to itself. But, to turn to the actual work done of late by the working members of the Profession, we find the question of constitutional treatment as a method of curing tooth disease raised in a paper read before the Odontological Society by Mr. Stocken, upon "Certain Constitutional Remedies in the Treatment of Inflammatory Conditions of the Vascular Tooth Structures and of Neuralgia arising therefrom." The question was raised by Mr. Hutchinson, who thought that the Dental practitioner should only treat tooth disease locally, but if a case required constitutional treatment, that it should be handed over to the Medical practitioner, with the Dentist's ideas upon the subject. The President thought that the Dental Surgeon was justified in using any means at his disposal, whether constitutional or local. It is presumed that Mr. Hutchinson referred to Dental Licentiates and Dentists *sine* diploma, and not to Surgeons practising Dental Surgery, whilst the President probably referred to Surgeons. The remedies spoken of were chloride of ammonium in facial neuralgia and periostitis. Such high authorities as Dr. Anstie, Dr. Ringer, and Dr. A. Lindsay were quoted as highly recommending this drug; but the opinion of others—Mr. Coleman, Mr. Oakley Coles, and Mr. Gaddes—were divided, whilst Mr. Arthur Underwood believed that it gave relief in nine cases out of ten.

With regard to sulphide of calcium in periostitis and alveolar abscess, experiences were much divided, but we have ourselves found it generally beneficial in periostitis.

Gelsemium, or gelseminum, in dental neuralgia, is generally approved of by those who have used it. Transplantation and replantation of teeth have received numerous further trials by eminent men, and the latter, more especially, has been productive of much good in cases of chronic alveolar periostitis and of alveolar abscess. Drs. Magitôt, of Paris, and Finley Thompson, of London, have been the chief workers in this direction, and with much good result.

Pepsine, as a devitalizer of the dental pulp, has been brought forward by Dr. Arkövy, of Buda-Pesth, and it, together with arsenious acid (an old friend), he finds to be the only available agents.

Theoretical inquiry in Odontology has received a stimulus by the very praiseworthy investigations of that young, but indefatigable, worker, Mr. Arthur Underwood, and Mr. W. J. Milles, into the effects or organisms upon the teeth and alveolar portions of the jaws. A paper was read by them upon this subject at one of the meetings of the Section of the Diseases of the Teeth, at the International Medical Congress, in which they detailed the varieties of the organisms met with in the mouth, the conditions favourable to their existence, and those in which their life is impossible, their effects upon the enamel and upon the dentine. They then proceeded to demonstrate the destruction of tissue—first, in teeth subjected to the action of acids under aseptic conditions; and, secondly, in teeth subjected to the action of germs under excessively septic conditions. They investigated previous experiments as to the causation of caries, showing that where artificially produced, it has been under septic conditions, but that it has not been produced under contrary conditions—that is to say, in the presence of antiseptic agents such as carbolic acid and creosote. They then showed the effects of organisms upon the surrounding tissues, and the difficulty of maintaining a septic condition of the mouth. They also gave the results of their use of eucalyptus oil and iodoform in cases of alveolar abscess, in dead roots, and in roots partially dead, and quoted some typical cases.

Whatever may be the result of the further investigation of this theory—and it is only an application to a certain portion of the body of the theory of Professor Lister—those more especially interested in this branch of the Profession cannot fail to admire the perseverance and assiduity of these two gentlemen, who have given up so much time to the investigation of this subject.

Rigg's disease, or the premature wasting of the alveoli, also received attention at the Congress, in a paper read by Dr. W. H. Atkinson, in which he contended that the disease is due to debility, and that the removal of all dead bone until living tissue was reached, was the proper treatment. Dr. Walker showed the starting-point of the disease to be a sub-acute inflammation of the periosteum, whence it passed to the bone, and the point of interest was to account for the great activity of this sub-acute process. Mr. Walter Coffin advocated the removal of the diseased tissue and the application of hydrate of phenol. Mr. Oakley Coles thought it necessary to warn his brother practitioners not to localise their treatment so as to forget the constitutional part of it.

An interesting paper was also read by Dr. Norman Kingsley, on "Civilisation in its relation to the increasing Degeneracy of the Human Teeth," in which he brought forward this view—that none of the previous explanations, alone or combined, could account for the existing state of things, but that in proportion as civilisation advanced, so there was a corresponding decrease of nerve power, with attending increase of nervous diseases, and coincident (perhaps consequent) deterioration of the teeth.

Turning to the late Odontological literature, we must notice Mr. Coleman's "Manual of Dental Surgery and Pathology," which must take its place amongst the standard literature of the speciality. Mr. Arthur Underwood's "Surgery for Dental Students," although by a specialist, and for intending specialists, treats more about general surgery, and need only be mentioned in this place. Another monthly, too, has come into being to swell the list of special journals already existing—the Dental Record, edited by Mr. Thomas Gaddes.

We cannot close this review of the progress of Odontology without referring to the very needful expurgation of the Dentists' Register, by which many unprincipled men, who had professed to be practising dental surgery, but with no pretensions thereto whatever, have been struck off that somewhat heterogeneous collection; and we notice that permission has been given for those fully qualified surgeons who have thought fit to appear in the Dental Register to register their surgical and medical qualifications as well as the special one; so that there now appear three different sets of men—viz., those surgeons who practise dental surgery as a speciality, those who hold the dental diploma only, and those who are totally unqualified, but who were allowed to register because they were supposed to be practising dentistry (*i.e.*, had drawn teeth) when Sir John Lubbock's Act became law.

We see, then, that Odontology has not been behind the other specialities in theoretical investigation, in practical application, and being recognised (as it should be) as a department of the wide field of general surgery.

SIX CASES OF SYPHILITIC NECROSIS OF THE JAW.

(Under the care of Mr. E. Downes.)

(The *Lancet.*)

Case 1.—A young man from Yarkand, who was literally dying from the pus which he had daily to swallow from necrosis of the whole bone of the lower jaw, from one condyle to the other. Nothing but removal of the entire bone seemed likely to do any good. This was done in July, 1877, by an external excision. The operation was a formidable one in which the able assistance of Drs. Williams and Ross of the Indian Medical Service was both acceptable and extremely serviceable.

The patient was placed in an arm-chair, and chloroform was given.

An incision was then made from a point opposite the condyle on the left side to the angle, along the bone to the symphysis, and from thence to the corresponding spot on the right side. There had been so much inflammatory action that the facial arteries were obliterated and required no ligature. The flaps were turned up, and it was then found that a good deal of reparative action had been going on. The operation was completed by removing the whole bone, temporal processes and articulations. There was no real difficulty about the operation, and, thanks to the excellent assistants, was speedily completed. Dr. Williams put in the sutures, using by preference horsehair for the purpose. The patient had to be fed on milk for about a fortnight, but during that time he never suffered much pain, and he did not have a bad symptom. The sutures held firmly, and the outside wound healed by first intention. There was some secretion of pus in the inside of the mouth as the cavity left by the jaw healed, but it was much less in quantity and less offensive than that formed before the operation.

The patient's health improved from a day or two after the operation, and he steadily gained strength till he left the hospital, which was little more than a month after the operation. At that time few people would have suspected that his jaw had been removed, had it not been he adduced the "ocular proof" in the old jaw, which the patient carried away to his native land, wrapped up in a piece of newspaper.

Cases 2 and 3.—The success of the above case led Mr. Downes to attempt the removal of half of the jaw on two occasions in 1878. One case was that of a middle-aged man, a Hindoo. In this case the discharge of pus was excessive, and was poisoning him. He was first seen with Dr. Currie, the Civil Surgeon, who thought that his health was so much impaired that operation was not advisable. However, it was at length decided to give him the chance of operation, and Dr. Currie kindly assisted in the operation. The other case was of a woman, also middle-aged, and a Hindoo.

It is not necessary to describe the operation very minutely. In both cases the disease, though very extensive, was limited to one side. The operation was the same as that done in Case 1, except that the incision was limited to one side, and the bone was cut through a little to the side of the symphysis with a Hey's saw and bone forceps. In the case of the man (Case 2) the external wound healed without difficulty; in the case of the woman (Case 3) a fistula formed which gave great trouble, but eventually healed. In both these cases, one or two incisor teeth on the other side became loose, and had to be removed. In the case of the man, a piece of bone remained bare some months afterwards, and probably has loosened and come away without much trouble; but he has not been seen for more than a year.

In both these cases a great deformity resulted. The face was very much drawn to the side from which the bone was removed. Though both these lives were saved by the operation, the result was not quite satisfactory in either case, and contrasted very unfavourably with that of the three cases recorded below, in which about half the aw was removed from the inside of the mouth.

Cases 4, 5, and 6.—All these three cases were seen in 1879, and were tolerably young men, and in each case the disease was extensive, though quite confined to one side, commencing about the first bicuspid tooth and extending back nearly to the articulation, though in all three cases the joint was unaffected. In one case the temporal process was diseased, but not in the other two; the bone was loosened in all three cases opposite the first bicuspid tooth, but the disease was still progressing in the other direction. In one case the patient applied to have his last molar tooth extracted. It was only while this was being done the full extent of the disease was discovered. The state of affairs was explained to the patient, and with his sanction chloroform was given, and the operation completed.

The operation in all three cases was very similar. The patients were placed under chloroform, in the recumbent position, and after removal of the teeth on the diseased side the periosteum from the bone was separated as far back as possible from the line of demarcation near the bicuspid tooth, backwards. There was a little hemorrhage. The denuded bone was then seized with lion forceps, and in each case the bone broke at once near the angle. The end of the bone having again been seized with the lion forceps was pulled out as far as possible, and the periosteum was separated a little further. Thus, in all three cases, the whole of the diseased portions of the bone was removed, including the temporal process and articulation. Considerable force had to be used in one case in order to tear asunder the tendon of the temporal muscle. In another case the muscular fibres of the internal pterygoid were ruptured. No injury was done by this seeming violence, and there was no troublesome hemorrhage.

The patients complained of very little pain afterwards—in fact, they were very pleased at getting rid of their diseased jaw, and the loathsome discharge attending it. For a few days there was a good deal of swelling, but there was not a very great discharge of pus, and in less than a fortnight the wound was healed and new bone had commenced to form; the healing process continued satisfactorily, and all three patients left the hospital in about three weeks with very little deformity.

Remarks by Mr. Downes.—Kashmir is a country whose inhabitants have all, or nearly all, become syphilised, and, as a rule, no antidote is taken to counteract the poison of the disease. The consequence is that syphilis is very often seen in the worst forms in the tertiary stage. Diseases of the bones are met with frequently, and among the bones implicated the lower jaw is not uncommonly affected. Many bad cases of necrosis of the lower jaw occur, and on several occasions I have removed pieces of dead bone with good success. I I have once had to remove the whole of the lower jaw, and in five cases I have removed it on one side, and in no case did a patient die. The chief object of the above record is to compare the two methods by which the bone may be removed—viz., from the outside, as, I believe, is commonly done, or from the inside, as was advocated so strongly by the late Mr. Maunder. It will be seen that I have been forced to accept the latter as the better operation.

BUCCAL TUBERCULOSIS.

THE similarity of many of the pathological processes which affect the fauces and the larynx renders the occurrence of tubercular affection of the former a matter for little surprise, although of considerable interest. Five cases of primary tuberculosis of the soft palate have been published by Küssner. In all miliary tubercles were present, isolated yellowish-white nodules in the mucous membrane, surrounded by injection. Much more remarkable, however, were the lesions, apparently of the same nature, which were present in the mucous membrane of the mouth in a case which has been described by Eichhoff. The patient was a man, aged thirty-nine, who had never suffered from syphilis. The lower lip had become thickened and pendulous, so that the mouth could not be closed, and the mucous membrane over it presented numerous rugæ, and at its junction with the gums was an irregular ulcer, with thickened edges, half an inch in length. The upper lip was similarly affected, with ulcers between the lip and the gum. The mucous membrane of the tongue was thickened and uneven, yellowish nodosities being scattered over it, and an ulcer occupied the tip, while others were scattered over the hard palate, the soft palate being intact. The right tonsil was covered with yellowish prominences similar to those upon the tongue. The patient was suffering at the time from phthisis, and died soon afterwards. The diagnosis that the lesions in the mouth were tubercular in nature was confirmed by a microscopic examination.—*The Lancet.*

NATIONAL DENTAL HOSPITAL AND COLLEGE.

ANNUAL DINNER.

THE annual dinner of the staff, past and present students of this Institution, was held at the Guildhall Tavern, on the 16th ult. Mr. S. Lee Rymer, President of the College, in the chair. About seventy gentlemen sat down to dinner, including many of the past, and nearly all the present, students.

The usual loyal toasts having been responded to, Mr. W. H. Ash proposed the "Committee of Management," and instanced the great improvements which had been made in the Hospital premises, and the largely-increasing number of patients attending; and he was sure those facts bore ample testimony to the energies displayed by the Committee.

Dr. Strong (Croydon) replied.

The Chairman gave the "Medical Profession," alluding in flattering terms to the labours of Dr. Alfred Carpenter and of Dr. Richardson, in advancing the status of the Dental Profession. On the occasion of the first meeting of Dentists, at the London Tavern, Dr. Carpenter was in the chair. That was on the 22nd of September, 1856. He said that he felt confident that, in such an assembly, the toast would be most cordially received, as all present had had more or less intercourse with members of the Medical Profession; those in practice as Dental Surgeons could testify to the ready co-operation of medical men with them in consultation, and it was a matter of history that in the course of the proceedings which had led to the consolidation of the Dental Profession, and to its recognised legal position now, as compared with the chaotic state of past years, immense assistance had been rendered by the Faculty of Medicine, for which they were deeply indebted. Dr. Carpenter, in the early days of the reformatory movement, had given valuable practical advice as to the course of procedure, and, educationally, he had assisted them by delivering lectures of extreme value at the old College of Dentists, and now he was amongst them that evening to evince his continued interest in their prosperity. The Metropolitan School of Dental Science, the first Dental School in the United Kingdom, was founded on the 5th of October, 1859, and Dr. Richardson delivered the inaugural address. In his concluding remarks, Dr. Richardson so forcibly dwelt on the conditions of success in study, pointing out that these lay not so much on teachers as on the inner self; he (Mr. Rymer) doubted not but that the excellent advice then tendered had not been thrown away; and to that fact was owing the good position to which many of their students had attained, and were attaining. Again, at the College of Dentists in 1866, the Doctor delivered his memorable course of lectures on the "Origin of Diseases of the Teeth and Maxillæ." These important lectures had been published, and were highly appreciated for reference. It was only the other day that, after a considerable interval, Dr. Richardson had again come amongst them educationally at the Odontological Society, where he was welcomed as an old friend, re-appearing, as he himself humorously observed, in veritble Rip Van Winkle fashion.

Many who were present at those meetings, Mr. Rymer was pleased to see around him again. They would remember the chaotic state of the Profession at that time; but to the young men, whom he rejoiced to observe among them in such strong force, those events were matters of history.

Dr. ALFRED CARPENTER (Croydon), in responding to the toast, said that Mr. Rymer did not mention the fact that it was he (Mr. Rymer) who inaugurated the meeting at the London Tavern; and the great importance of that meeting was due to the public spirit of their present chairman. It was of consequence to his (the Medical) Profession that the Dental Profession should be able to hold their own, and be independent of the members of the Medical Profession.

Mr. STEPHEN HOOL proposed the "Health of the Medical Staff." Having alluded to the several members of the staff, and passed eulogies upon them, he said there were two Dental Schools in London, but though they were rivals, they were not enemies.

Mr. WILLIAMS responded.

Dr. ALFRED CARPENTER, in proposing the "National Dental Hospital and College," spoke of the Chairman, Dr. Strong, and himself, being members of a sanitary body. The investigation of the causes, and the prevention of the origin of disease, were the objects which they had before them. The direction of similar energies likewise applied to the causes and prevention of Dental Caries. These were the days of Conservative Surgery, and, necessarily, of Dental Surgery, and, in carrying out those principles, every Dentist should make notes of the times at which diseases of the teeth occur, and of the course which they take. The Medical Profession do now know how diseases arise, and how they are to be prevented; and he hoped that the time was not far distant when, through the agency of such educational institutions as the National Dental College, the same will be found in regard to caries of the teeth.

Dr. ATKINSON (Kew) gave the "Past and Present Students." In the course of his speech, he spoke of anæsthetics, and cited the following very interesting incident, showing the very great antiquity of the principle of anæsthesia, and also of the operation now known as Cæsarian section. A Persian warrior, named Zál, was betrothed to a Princess, named Rúdábeh, and the astrologers had foretold that their offspring would be a hero of matchless strength and valour. Zál, on his return through Kábul, had an interview with Rúdábeh, who welcomed him in the most rapturous terms:—

> Be thou for ever blest, for I adore thee,
> And make the dust of thy fair feet my pillow.

In short, with the approbation of all parties, the marriage at length took place, and was celebrated at the beautiful summer-house where first the lovers met.

When, in the year 950, Rúdábeh was advanced in her pregnancy, she suffered extremely from constant indisposition, and the deepest distress prevailed on account of her precarious state.

> The cypress leaf was withering; pale she lay,
> Unsoothed by rest or sleep, death seemed approaching.

At last Zál recollected the feather of the Símurgh, and followed the instructions which he had received, by placing it on the fire. In a moment darkness surrounded them, which was, however, immediately dispersed by the sudden appearance of the Símurgh. "Why," said the Símurgh, "do I see all this grief and sorrow?

> "Why are the tear drops in the warrior's eyes?
> A child will soon appear of mighty power,
> Who will become the wonder of the world,
> But not in nature's course, unaided, born!
> The mother must be drugged with soothing wine,
> Till sense forsakes her, and she feels no pain;
> Then must her side be opened, and the infant
> Drawn through the wound. This being done, close up
> The deep incision with the nicest care,
> And take the herb, which I shall give to thee,
> Prepared with milk and musk, and rub it well
> Upon the severed flesh, and pass this feather
> Along the part, and health will be restored."

This advice was implicitly attended to, and the result was as foretold. Rúdábeh endured no anguish, and never was beheld so prodigious a child as the Símurgh thus brought forth into the world. The father and mother were equally amazed. They called the boy Rustem. On the first day he looked a year old, and he required the milk of ten nurses. At three years of age he rode on horseback, at the age of five years he ate as much as a man, and at his eighth year he was as powerful as any warrior. When they remembered that those events occurred nearly a thousand years ago, they could justly conclude that the "Past Student" was by no means a modern institution.

Mr. FREDERICK ROSE, replying as an old student, said that last year it was his pleasure to respond to this toast on behalf of the "Present Students." Now he felt himself out of place, as he was only a sort of chrysalis, and but lately fledged. Yet he heartily thanked Dr. Atkinson for his warm expression of goodwill. The number of gold-fillings, he was pleased to observe from the published returns, were largely on the increase, and that spoke of the prosperity of the School.

Mr. BATE, as a present student, spoke of the general satisfaction felt by the students with the officers and teaching of the Institution.

Mr. WEISS, in complimentary language, proposed the "Health of the Dean," and Mr. Gaddes replied.

Mr. HARRY ROSE proposed "The Visitors," and Mr. Pillin having responded,

Mr. STOCKEN gave the next toast, "The Dental Schools," and said the circumstances of the times justified a very favourable view of the status of the Dental Profession. Schools are now springing up in all parts of the country, and these facts, together with the unmistakable progress of the National Dental Hospital and College, were to him most gratifying. All that progress and consequent advancement were not more than was necessary. The public required a greater number of educated practitioners, and the two existing Metropolitan Schools were not more than the necessities demanded. He remembered speaking to Mr. Thos. Arnold Rogers on the subject of these schools, and that gentleman expressed the opinion that if the two hospitals were united to-morrow he should wish another hospital and school to spring up the next day, for fair and generous rivalry was always beneficial. Upon the students he would urge that what was worth doing, that do well, and thereby testify to the efficiency of their respective schools.

Mr. OAKLEY COLES proposed "The Health of the Chairman." Speaking of his services to the Profession, he said Mr. Rymer was ready to conceive the scheme of a College of Dentists, and also, at a future time, to bring about its amalgamation with the Odontological Society. These were examples of what they, as young men, had to follow; and Mr. Rymer, who has always the interests of the Profession at heart, is a gentleman to be held up as a model.

The toast was received with acclamation, and Mr. Rymer replied.

A programme of instrumental and vocal music was performed, Mr. Chas. Davieson presiding at a grand piano, very kindly lent for the evening by Messrs. Kirkmann and Son.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE first meeting of the Session was held at 40, Leicester Square, on Monday, the 7th ult., Mr. Thomas Arnold Rogers, President, in the chair.

The PRESIDENT announced that Mr. David Hepburn, of Edinburgh, had been compelled to retire from practice owing to ill-health, and the Council considered it right, and they proposed that he should be elected an Honorary Member of the Society. The President felt sure that this would meet with the approval of the members generally.

Mr. Woodhouse proposed, and Mr. Coleman seconded, a resolution to the effect that the thanks of the Society be given to the President for his great munificence and liberality in defraying all the expenses of the conversazione given by him on behalf of the Society during the meeting of the Medical Congress, and that the thanks of the Society be also given to Mr. Edwin Saunders for the delightful entertainment given by him during the same meeting.

The President, in reply, said that he felt the great compliment which the Council had thus paid him, and also the privilege in allowing him to take upon himself the whole responsibility of that entertainment. He was anxious that the funds of the Society should be kept as far as possible for scientific purposes. If he had been guilty of any omissions he hoped they would be excused.

Mr. Mummery exhibited the skull of a Fingo, a race of people nhabiting the South-west of Africa. All the teeth were perfect, and there was not a trace of caries, though the skull was that of an old man. The left upper third molar was absent, an occurrence very unusual amongst savage tribes, in whom the wisdom teeth were generally fairly well-developed.

Mr. Lawrence Read showed, on behalf of Mr. A. Howarth, of Bradford, a new flask and clamp. Mr. Read had used it for six months, and had found it to possess all the virtues claimed for it.

Mr. Chas. S. Tomes showed the very large odontome odontoplastique, which was removed by Mr. Christopher Heath and exhibited at a meeting of the Clinical Society, on the 14th of October. An account of this tumour is given on page 199 of the November Number of the *Dental Record.*

Dr. B. W. Richardson then read a paper on the Causes of Dental Caries, Constitutional and Local.

If any of the members of the Society should find it worth their while to spend a few days at Hythe, in Kent, they would do well to go to the crypt there, in which they would find a number of skulls, and they would be told that they were left after a great battle fought between the British and the Saxons, about the year 450. De Foe also mentions them in his travels. Dr. Richardson had devoted a considerable time to the study of those skulls, and he divided them into different classes, probably four distinct types being recognisable. Some of them were refined and with small jaws, which he took to be Roman; others with thick, coarse jaws, and rough places for the attachment of muscles, he took to be Teutonic; while others were Scandinavian, &c. He here showed some photographs of the varieties.

A great many of the skulls were toothless, owing to visitors taking the teeth away; but, on examination, he failed to find any trace of caries in the teeth.

In our present state of civilisation caries appeared to be, of all others, the predominating disease affecting the teeth in this country. He had for some years past introduced into his tabulated clinical records a note respecting the condition of the teeth, and the result of that inquiry had surprised him. They showed that over 80 per cent. of the persons who came to him were affected more or less with dental caries, and the number examined amounted to over 4,000 of both sexes, and of all ages. In the course of his experience it was rare to meet with a person in whom both sets of teeth were quite free from caries. He believed that the disease was now more prevalent in the young than it was when he commenced medical practice thirty-two years ago. The study of caries was, therefore, of more than mere professional, it was of national, importance. For such a general development of disease we must look for general causes. Local causes might tend to bring out a predisposition, but it was evident that these could be only secondary, and that the almost universal tendency to disease must have a deeper, or constitutional, origin.

In his experience syphilis was the most common constitutional cause of caries, and he was strongly inclined to believe that the general prevalence of the affection was largely due to that cause. According to Professor Gross, there was a very wide diffusion of the syphilitic taint among all classes in the United States of America. Out of a population of forty millions, he estimated that about two millions were directly affected with the syphilitic virus. This estimate tallied very closely with that made by Dr. Holland of the number of syphilitic subjects in Great Britain, and he (Dr. Richardson) had no doubt of the correctness of both these conclusions, for what was true of America was likely to be true of England. These figures referred only to adults, who might be reckoned as forming about two-fifths of the whole population ; but their offspring must also be taken into account, and it was very doubtful whether any of the offspring of persons affected with syphilis could be considered free from taint.

The secondary effects of syphilis interfered with the nutrition of all parts, and led to special derangements of nutrition in the fibrous and osseous textures of the body. Contracted in adult life, it cannot materially affect the dental structures, though in former years caries as the result of mercurial treatment was common enough, but it was quite distinct from syphilitic caries. The hereditary constitution left by syphilis was undoubtedly indicated in the next generation by disease of the teeth, and by a constitutional state in which caries was readily developed. The results of his own observations on this subject fully confirmed those of Mr. Jonathan Hutchinson.

Next to syphilis as a constitutional cause of caries, he placed dyspepsia. Many would, no doubt, give this the first place, and he admitted that it was difficult to say which was the more important. The form of this disease which produced the greatest amount of evil was that which was induced in the first months of life by improper feeding, and especially by the substitution of artificial foods for the natural breast milk. At one time he thought that the effects of dyspepsia in producing caries were only developed in the period of infancy, and he still thought that this was the most common time for the commencement of the evil. The child, being deprived of its natural and admirably adapted food, and supplied with nourishment which its stomach could not digest, nor its body assimilate, its tissues generally were imperfectly constructed. And although it might retrieve in after life some of the harm which had been inflicted in the case of tissues which were constantly undergoing reconstruction, in the case of such structures as the teeth, which were made for the whole of life in a few critical months, perfection was impossible if the start was bad. If we could go back to the history of those ancient people at Hythe we should find that the children and the mothers were fed more upon natural food.

The influence of the scrofulous and the tubercular diatheses in producing caries Dr. Richardson thought had been exaggerated. The scrofulous and the tuberculous often suffered from very obstinate and troublesome dyspepsia, and the grafting of syphilis on struma produced some of the worst results with which a physician ever had to deal. But, excluding those causes, he did not believe that struma, by itself, necessarily predisposed to caries. The dentist saw many strumous patients with bad teeth, and held the diathesis to be the cause ; but the physician was often surprised to observe, amongst all the havoc which struma inflicts upon its victims, how wonderfully the teeth escape.

At one time there had been a great controversy as to whether the epidemic diseases of children exerted any influence on the permanent teeth, leading to caries in later life ; but careful observation, extending over more than twenty years, had convinced him that those diseases had no such effects.

Practically, then, the constitutional causes of caries might be said to be the hereditary taint of syphilis, and the occurrence of dyspepsia, and consequent faulty nutrition during the development of the teeth.

He believed that caries was rarely of purely local origin ; but, when there was failure of nutrition within the tooth, very slight external causes, acting physically or chemically, would produce rapid effects. The action of heated fluids taken into the mouth, the action of acids upon the teeth, deficient cleanliness of the teeth, and, exposure of the teeth to the action of certain chemical substances during work at some special occupations, were a few of the direct local causes of caries that had been asserted, but he believed that they were of comparatively slight importance. He had met with one or two instances in which toothache and caries had apparently resulted from cracking of the enamel consequent on taking heated liquids into the mouth, but he thought the direct causation was open to some measure of doubt. With regard to the second cause, he had never been able to satisfy himself that acids taken into the mouth simply in solution with food played any direct part in the production of caries. Deficient care in cleaning the teeth might, under certain circumstances, be a cause of caries, though the fact that this disease was rare amongst uncivilised nations and animals, showed that if the secretions of the mouth were healthy, systematic cleaning of the teeth ought not to be necessary. The action of corrosive substances upon the teeth of those who were engaged in certain industries produced decided effects in some few instances, but these were not so extensive as might have been supposed. Those who suffered most from this cause were fur-dyers, chlorine-workers, bichromate-workers, bronzers, and in a less degree, flax-dressers, and tobacco-workers.

There were two points on which he thought that the experience of dentists would be instructive to medical practitioners. First, did caries ever proceed from without inwards in the direction of ulceration? Secondly, when one tooth had become carious, was it at any stage of the disease liable to directly contaminate teeth that were in immediate contact with it? The popular opinion on both these points was no doubt affirmative, but he had some doubts in his own mind, and should be glad of reliable information on the subject. In the latter case he thought that the caries of two adjoining teeth were more likely to be due to the exposure of both to the same cause than to direct infection from one to the other. Upon the members of the dental profession he urged the importance of impressing upon all with whom they came in contact the necessity of living a better and more natural life if they wished to exorcise the terrible disease which was demoralising civilised humanity, and of assisting to promulgate the natural law that it was the duty of every mother, of whatever rank, to nurse her child, and gradually to lead its vital steps into healthy independent existence.

The President said that Dr. Richardson would, he had felt sure, read a good paper, but he had not expected him to open up so wide a field for discussion as he had done. With regard to the questions to which he had requested answers, he thought that in both cases the popular answers would generally be allowed to be correct. There could be no doubt that, except in very rare cases, caries spread from without inwards; and that the disease generally depended on an external cause, was shown by the fact that if in a badly-decayed tooth the decay be covered over so as to exclude external influences, the process would be arrested or greatly retarded.

Mr. Mummery mentioned that Dr. Richardson had not noticed a cause of dental caries to which attention was called by Dr. Kingsley in a paper read before the Medical Congress. There could be little doubt that constant mental excitement had much to do with the loss of the teeth. Amongst civilised races, it was found that, as the size of the brain increased, that of the jaw diminished, and the teeth were less perfectly developed.

Mr. Coleman said that Mr. Cartwright and he had examined the skulls at Hythe, and they had reported the results to the society seventeen years ago. They found distinct evidences of dental caries and of alveolar abscess, and their experiences did not, in that respect, coincide with the observations of Dr. Richardson. With regard to the effects of syphilis, his experience was that the teeth of syphilitic persons were scarcely more subject to caries than those of other delicate individuals, and he was disposed to attach much more importance to the use of soft food and other incidents of civilised life than to syphilis. He thought that the fact that a carious tooth could infect its neighbour was proved by common observation; for if a carious tooth was allowed to remain long in the mouth, the one next to it was pretty sure to become affected, but if it was removed at an early stage of the disease no more caries appeared.

Mr. Arthur Underwood said that some investigations which he had recently been prosecuting indicated that the chief local cause of caries was the presence of germs. If germs were excluded from the solutions acids or fluids would not produce true caries—their presence was a *sine quâ non* for its occurrence. At the same time, he thought there must also be a constitutional predisposition, or weakness, which might be due to syphilis or to improper food, or to other causes.

Mr. Oakley Coles said caries was very liable to occur as a sequel of exhausting diseases, as after typhoid fever, and also as a result of pressure and undue impact of the teeth. The concussion of the teeth in mastication caused cracking of the enamel, the cracks admitted germs, and decay resulted. These were two causes of caries to which Dr. Richardson had not alluded.

Mr. D. Hepburn thought that the effect of tobacco smoking on the teeth was rather beneficial than otherwise, and that confirmed smokers were rather less liable to caries than other people.

The discussion was continued by Mr. Hutchinson, Mr. Mummery, and Mr. Charles Tomes; and Dr. Richardson having replied, the meeting was adjourned.

ODONTO-CHIRURGICAL SOCIETY.

The ordinary meeting of the Society was held on the 10th November, John Smith, Esq., M.D., F.R.C.S., President, in the chair.

The minutes of the annual meeting having been read and approved,

Frank A. Huet, L.D.S.I., Manchester, was duly elected a member of the Society, and David Hepburn, L.D.S.Eng., Edinburgh, was unanimously elected an honorary member.

The President delivered the following address on Scientific Inquiry :—

Gentlemen,—I rise with feelings of much gratification to address you as President of the Odonto-Chirurgical Society for the ensuing year; and in doing so, I do not think it incumbent upon me, or likely to be desired by you, that on such an occasion I should detain you with an effusion of any particular length. It was Sydney Smith, I think, who used to say that in antediluvian times a speech of three or four hours' duration was neither here nor there, but that orators of modern days ought to remember the flood, and study brevity. I entirely coincide with the views of the reverend gentleman, and, in the present circumstances, shall follow his advice.

Some little difficulty at first occurred to me in deciding upon what topic the opening address before a society of this nature should turn: whether it ought to be a retrospect of what had been done by this as well as various other similar bodies during the past, or whether it might not be more in keeping with our first meeting here that any remarks should be made to refer rather to some subjects connected with the future; and leaning towards this last view of the matter, I resolved upon offering a few brief and discursive observations, relating prospectively in certain ways, and, in some considerable measure, to those objects, and the mode of carrying them out, which necessarily appertain to such meetings as ours in this place, matters which, I think you will agree with me, it might be well to keep in view as essential towards the prosperous working of this or any other scientific society. And I must here premise that in advancing observations, I do so more as a summary or recapitulatory sketch of what you already know, than as subjects having in themselves anything new or original.

The chief end of a society of this nature, I need not say, is the promulgation, the diffusion, the communication of useful or interesting knowledge, especially in its own department of science. This may be effected in one case through the medium of conversation; in another, by actual demonstration; and in a third, by studied and formal written communications. Further, such knowledge may be itself derived from the three sources—first, of investigation and research;

second, of direct observation, and casual or incidental experience; and thirdly, from that source which affords, perhaps, more scope and opportunity for general discussion and the expression of opinion, namely, where the contribution is founded upon certain plausible theories or specious hypotheses, originating in the mind of the contributor, or, it may be, on some occasions, only existing in his exuberant fancy or fertile imagination.

But whatever may be the mode adopted in conveying such information, and whatever may be the source from which it has originally sprung, its value will always be proportionate to, or altogether dependent upon, the nature and the amount of the evidence adduced in its support, and the integrity and amplitude of the manner in which such evidence has been examined and investigated. And this brings me to what I may set down as the main subject I have here to submit to the Society, namely, a consideration of some of the peculiarities of those data at our disposal for the determination of enquiries in the physical sciences, and the method according to which such data ought to be regarded, and made the subject of deliberation.

Among the different species of evidence to which the enquirer in natural science looks for information, there is scarcely any form presented more frequently, or possessing greater importance, than that of statistics—in other words, a group of absolute and similar facts multiplied till it becomes so large as to justify the acceptance of some given conclusion to be drawn from it.

Quality of our Data.

In speaking before a society of this nature, I need not enlarge upon the value of data of this kind, *when accurate*, in the advancement of medical science and its associated branches. But it may be well, on the other hand, to keep in mind that evidence presented in such a shape is always open to serious errors, mistakes, and fallacies, from which the precise and unmistakable demonstrations applied to mathematical reasoning are completely free. And it is this consideration which should enjoin upon us the most watchful caution, and a prudent reserve and hesitation, in adopting or accepting as conclusive, in anything like a rash or precipitate manner, results founded upon such a method of enquiry.

In mathematical reasoning, the mind is compelled to accept as absolute certain evidence which, in the nature of things, admits of no manner of doubt whatever. In the physical sciences, however, our conclusions are drawn or reasoned out from data which are in many ways fallible. But bearing this in mind, and refusing to accept any conclusions until the data upon which they are founded are verified by observation and experiment—until every condition necessary for trusting to conclusions drawn from them is complied with—if we are careful that no omission of any essential consideration, no admission of what may be spurious and accidental, no neglect of the balance of probabilities—no such sources of error are overlooked—the mind can little more hesitate to accept the evidence of such data than it can to admit the truth of a mathematical demonstration.

REASONING FROM DATA.

Unfortunately, however, while on the one hand that completeness and authenticity of data here implied is by no means always secured; neither, on the other, is the mode of investigating such data all that could be desired, in scientific research. Bias, partiality, prejudice, self, in the one ease; and ill-founded, ill-assorted, ill-digested evidence, in the other, lead to many errors, and consequently to the reliability and the teachings of statistics being so very generally questioned and mistrusted as they are.

It is much more difficult than at first might be supposed, to avoid a certain prepossession in favour of one's own opinions, in reading the data available for scientific research. The mind inclines to some one or other side of the question, till, insensibly to ourselves, everything seems favourable to those conclusions we inwardly desire or wish to be the true ones. We resolve to maintain—impartially, of course, as we suppose—our own opinions; but our high estimation of them leads us to dress and set them off, as John Locke long ago wrote, to the best possible advantage, misinterpreting or changing the meaning of what is pertinent to the question, and often adducing, as if in support of it, ideas foreign to, and which neither elucidate nor strengthen its real position, but help to carry conviction in our favour.

Instances of this are to be found in every department of science, but we need not wander beyond the domains of medicine for its illustration. Fom the remotest records in the history of that art, down to our own times, the transient and ephemeral nature of so-called doctrines, founded on propositions thus imperfectly established, is abundantly and manifestly exemplified. The decline of Grecian medicine, after the death of Hippocrates, showed, at that early period, the evil of departing from the matter-of-fact method of reasoning on the sure grounds of observation and experience, adopted by the father of medicine, and the short-lived lustre of many of the speculative and conjectural, although ingenious assumptions, of the theorists and systemists, who have, ever and anon, flourished since his day, bears convincing testimony in the same direction.

Paracellus, Stahl, Hoffman, Boerhave, Gall, Spurzheim, Hahneman, brilliant as were their theories, and replete with many valuable truths as were their systems, are now names of little else than antiquarian interest. With many other talented and ingenious thinkers—aiming too much at establishing their own pet notions to be correct, their great powers absorbed in proving what *they wished* to be the fact, misdirecting the grand truths of many of their arguments to prop up and sanctify some theory which was the idol of their worship—they have only attested that science is not permanently or creditably advanced by bolstering up individual opinions or adopted systems, but by a simple, rigid, and unswerving search for truth.

Time required for confirming our conclusions.

Even, however, with every care exercised, both in regard to the sufficiency of our data, and the fidelity exercised in their examination, it would appear as if the work of time were over and above required for the more complete apprehension, and full mental digestion of the information thus afforded. The mind of man is slow in making acquaintance with things, and in taking in new truths; and this must be kept in mind, before we can safely or justifiably pronounce, even after every care bestowed upon them, that our conclusions are final, exhaustive, and exact. Certain evidence, and the first opinions founded upon it, may, at the moment, appear incontrovertible; but as years roll on, and afford time for mature reflection, and as other and additional truths arise, side by side with those already existing, we may find, on going over the self-same field once more, with such super-added elements to assist us, that all its former aspect is now changed, and appears altogether defective and fallacious, teeming with oversights, and most strangely full of errors. Thus the rich storehouse of incontestable facts, opened up in anatomy during the fourteenth century, by Mundinus of Bologna's first dissection of the human body, followed by such early workers as Vidius, Sylvius, Vesalius, Eustachius, Fallopius, Varolius, Casserius, Cesalpinus—names which will endure as long as anatomy itself—has, for ages, afforded materials upon which no end of theories, in regard to the brain, the heart, the uterus, the respiratory, and all other organs, have, over and over again, from their remote day, down to our own, been advanced and accepted, to be only, and before long, rejected, and found wanting. Time, and little more than time, was required to discover that what had been approved, and apparently substantiated with axiomatic incontestability, from time to time, was, each in its turn, found to be palpably erroneous, altogether misunderstood, and a complete mistake; and it becomes us to remember this in advancing those views, and opinions, and conclusions, necessarily entailed in the communications incident to a society such as ours, in order to their enduring with that stability, and power, and credit, which we all would naturally desire.

DANGER OF TOO LIMITED DATA.

There is another sort of fallacy to be guarded against in the reading of statistics and such data, which is limiting our search exclusively to what may be little more than one factor in the aggregate range of the enquiry; *i.e.*, either through inadvertence, or intentionally neglecting the consideration of collateral facts, and thus failing to grasp, to its fullest extent, the teaching of such evidence as may be more immediately before us. This is allied to that sort of sophism which logicians term an *imperfect enumeration*, or *false induction*, when from a few experiments or observations, we infer general theorems, and universal propositions. An over credulity in the assertions of others forms an important element in this species of error, and often in this way becomes a source of much trouble and confusion, in the advancement of science. Rooted errors and old prejudices, have ever been, and still are, most difficult to remove. Common opinion, as it is termed, is most sturdy in its own defence, and only too ready to appeal for support, to some vague standard of general belief, or even to attempt substantiating its creeds in direct violation of the most ordinary laws of nature. Yet we find such popular notions and current beliefs, in many cases, treated as if they were scientific truths. And it too frequently happens, while carefully securing the validity of one set of facts, that we neglect to make equally sure of others, accepted and adduced on the same footing, and as part and parcel of our data: we neglect making sure that we are not taking them for granted, with an overweening, and too implicit confidence.

I have spoken of the necessity for exactitude in our data; of fidelity in their examination; and of time being required for confirming the correctness of our conclusions. Each of these considerations, as I have said, it is essential to keep before us, in framing the communications, and conducting the debates, incident to a society of this nature; since, without some such careful watching of the operations of the mind, our perception, apprehension, and conception of things, becomes indistinct and erroneous; our judgment of them false; and our reasoning and argumentation ill-founded and misleading.

And while offering a few condensed thoughts on such subjects, many instances of their application will no doubt occur to any one who reflects upon them. As an example, we may take the alleged deterioration of health in modern times, the appearing among us of new types of disease, the outcry as to increased prevalence of others, and among such themes, more specially appertaining to our own department, even the asserted increase of dental disease. These are a class of subjects frequently brought under notice of practitioners; and certain fractional statistics, certain special and adventitious circumstances in modern life, are, as we know, constantly suggested as affording some clue by which the mystery is attempted to be solved. Feeding, domestic surroundings, luxury, medicines, drainage, hereditary tendencies, a host of hypotheses are advanced, each of which has its strenuous supporters, and often a very considerable show of reasonableness about it. But, if we think of it, there is in reality far more than any one of these to be taken into account, if we would fairly judge in any questions of this kind. It is not alone the surroundings of the present day that affects the health, or the diseases, or the mortality of our population. Besides looking at what goes on around us, we should require to lift the curtain that shuts off the past, and hides and helps us to forget the times gone by. We should require to wander backwards from the present time, through generation preceding generation, and mark the innumerable, the enormous changes through which society has travelled since the dawn of modern civilisation; some of the incidents and phases of the way, its ups and downs, the storm and sunshine, the good and evil, met with on that long and up-hill road, over which, what is termed its "march," onwards to our time, has been accomplished. And if we would take these things into account, as well as, and in addition to, all the ills attendant upon our present artificial mode of life, and especially the growing tendency to congregate humanity in such swarms within our larger cities, it would at once be apparent that almost unnumbered causes were at work as the instruments of deterioration. A large proportion of these data are, however, suppressed or misinterpretated, and a premature and unsound conclusion is the result. The delicacy of the rising race is talked of; that certain diseases are commoner than they were; that their prevalence is unaccountable, or due to this or to that innovation, and so on, is thrust upon us, forgetting that under the accumulated agencies of which we have spoken, the whole physical character of the individual must have, so far, been modified and altered, even in what now is its state of health, and that there is, consequently, nothing very remarkable in its diseased conditions being also modified, and in some new ones being added to them. The wild flower, once defiant of the heats of summer, or the snows of winter, is now an artificial cultivated plant, difficult, perhaps, to keep alive, far less to maintain in health or vigour, with all the fostering shelter and most careful supervision of the hot conservatory.

I do not here, however, bring forward these matters in any controversial way, but merely as illustrative of my remarks, nor, need I say, am I intending either to confirm or confute the correctness of any allegations in regard to disease or mortality put forward at the present day. I merely adduce them as topics, which we, as practitioners, very frequently hear attempted to be explained, in a way, exemplifying the reasoning, popularly adopted in discussing such questions.

THE TABULATING OF STATISTICS.

Not to occupy much more of your time, however, allow me to allude to one other point, in addition to data in the abstract, and the mode of dealing with them, and that is,—What would be desirable if possible, in the recording, the compilation, the tabulating of statistics?

It may be considered chimerical or impracticable that so much time and trouble should be expended in the keeping of statistics, or in the classification of cases, such as we have to deal with, as would render our case-books so widely and absolutely reliable, as scientific data, in all their bearings, on any question respecting them, as we could desire. We could, in our own sectional department, only approach doing so by records which could never, in the meantime, be expected to be kept. Without even attempting to exhaust the catalogue of all that would be demanded, we should, beside the mere class of tooth—the operation, the age, and sex—of such cases as come under our care, require to tabulate, among other things, and in some uniform and systematic manner, the history, appearance, constitution, and habits of the patient; whether sickly or ill-fed; whether the offspring of the diseased or vicious; the inhabitant of squalid, or badly drained or pestilential districts; the trade worked at, the hours of employment; the wants, the vicissitudes, the excesses, the moral defects of our patients. It is Utopian, I say, to expect that the time and trouble involved in such records should, under present circumstances at least, be devoted to them. But I have no hesitation in saying that it is to the growing tendency towards keeping such minute details that modern medical science owes much of its advancement; and it is hopeful that this tendency prevails. To it are due in great part much of our advances in the etiology and treatment of disease. Errors have been thus detected, the existence of unsuspected causes demonstrated, difficulties in harmonising what used to appear as conflicting evidence removed, and interesting and startling results achieved which a very few years ago would never have been dreamt of; and assuredly it is an end that we should see to being kept in view in the nterests of our own special calling.

HAVE SUCH RESEARCHES AN ELEVATING TENDENCY?

Lastly, and in a few words, a consideration of some of those departments of thought not only tends to a more sound mode of reasoning on such subjects as we may take up, but to a salutary development of the mental and reflecting powers, and fits for the more efficient discharge of the duties which a professional life invariably entails. What is gained is not merely knowledge—it is mental discipline. The method demanded of us in drawing conclusions from data in the physical sciences is a training which not only enlarges the faculties of the mind, but is essentially a healthy one in developing those characters of observation which are of the greatest practical importance.

And, moreover, a clearer and more perfect understanding of the phenomena of what we meet with in the natural sciences is to ourselves personally always a matter of satisfaction and delight. In saying so, I speak not in my own words only, but in the spirit of those who have, with more power and eloquence, advocated such views as I have now here sketched out.

It has been said that such scientific study is opposed to the æsthetic faculties, and that, by imposing a restraint upon the imagination, they lower the mind to the prosaic standard of every-day life, and unfit it for the appreciation of what is higher, what is poetic, what is beautiful. But these authorities to whom I appeal tell us it is not so. It is the physical sciences alone, they tell us, which open up to our comprehension the truths of the wide universe around us; and whatever is true is beautiful. It is a wide field—so wide that no one mind can, any more than ourselves, obtain an adequate knowledge of more than a very, very small district of it here and there. Each may select those portions of it, such as opportunity may offer or inclination suggest. But on whatever spots the choice may fall, they are to be trodden with careful steps, and passed over with observant eyes. In this way scientific enquiry becomes a gain—the acquaintance with its mysteries an unspeakable privilege; and as new truths find access to the mind, so much nearer does it reach to the altitude and the wisdom of the great first cause, more and more clearly encompassing and comprehending the mysteries, and unveiling the wondrous beauty and fitness of the world around us, seeing and realising the perfection of nature's laws, and withal becoming better as we become wiser,—looking, as we are thus constrained to do, from nature up to nature's God.

A discussion was next opened on Mr. Whitehouse's paper, read March 11th—"On the Endowment of Research in Dentistry," the conclusion arrived at being—"That Endowment of Research was only useful in exceptional circumstances; that these circumstances did not, in the meantime, exist in the dental profession, but that the end desiderated by Mr. Whitehouse might possibly be gained by the formation of a Scientific Committee, whose duty it would be to investigate into the merits of 'filling materials' submitted to them, and that from this Committee should come a honorary reward, which would stamp the best filling with an unbiassed and official imprimatur, and thus secure it the confident and hearty acceptance of the profession, which would be the best reward to an inventor or discoverer." The following gentlemen, viz., Messrs. Wilson, Finlayson, Matthew, and Macleod, were appointed a Committee to give practical effect to this finding, by drawing up a basis of scheme for the formation of such a Committee, the same to be submitted for the Society's approval at next meeting with a view to its adoption, and, if possible, securing the co-operation of the sister Society.

The Secretary then read "Notes on Two Cases in Practice"—by G. Rankine Brownlie, L.D.S.Eng., Glasgow: "A Suggestion regarding Oxy-Chlorides." Some years ago, having been unable from want of light to use gold for a cavity in a first molar, opening partly on the masticating surface, but chiefly towards the second bicuspid, and extending quite down to the level of the gum, I used instead white cement, and instructed my patient to return during the summer months, when we could command a better light. On seeing it again, some six or eight months afterwards, the filling remained intact, quite unworn, and with no appearance of surface-wasting at any point. Being pressed for time, the filling with gold was again postponed. In this way I have had the opportunity of seeing it at intervals for six years. The last time my patient called was on the eve of a change of residence, and my interesting and promising filling was subsequently lost sight of. The filling was made from a fresh packet of material and the blue shade of powder (letter E, Ash's Rock Cement, I believe). In another instance, I was called on to remove two osteo fillings, and replace them with gold. Having cleared out the cavities, my patient remarked, "What faithful fillings they have been; it is over ten years since they were put in." By questioning, I was unable to find any doubtful feature in the statement. They were filled while the family were living in the country, and they had been over ten years living in town. One of these fillings was in no way depreciated, but the tooth carrying the other was beginning to discolour, and, on cutting it out, the junction of tooth and filling was at one point defective. The blue shade of powder had been used in this case also, and my patient remembered that the bottle from which the filling was taken was full. The cavities were insterstitial, upper central and lateral, and quite clear of the gum. With such cases before one, it seems as if careful research must sooner or later enable us to command, in a majority of cases, that which is at present an occasional and accidental occurrence. In the latter case, the result was *not* due to any idiosyncrasy of the patient, as similar fillings put in at a later date were clearly depreciated. The fact that fresh material seems to have been used in both cases (and possibly newly-made material), tempts me to believe that the cause of the early failure of oxy-chlorides is to be traced to some depreciation in the materials, through keeping them in the form of powder and liquid. I would respectfully suggest that those who manufacture for us be asked to make up the material in very much smaller parcels, using bottles of the very smallest size, and containing as much as would serve for, say two or three fillings only. Should this plan prove successful, no operator would grudge the increased charge to remunerate the makers for the extra trouble the proceeding would entail. These small quantities could be made up in dozens; and if kept sealed and dark till wanted, I very believe that early failure of oxy-chloride as a filling would be much less common.

Cases of Odontome.

Mr. Finlayson asked permission to introduce a young lady who was in waiting, and from whose upper jaw Mr. Annandale had removed a hard osseous mass, which, as would be seen from the models on the table, was causing considerable enlargement of the cheek, and consequent disfigurement of the face. Mr. Finlayson said the growth had been going on gradually for twelve years under his own notice, and had not at any time caused any pain to speak of—the patient's attention being first drawn to the size of the right cheek by her friends. Two examinations had been made during that period to ascertain whether it was cystic in its character, but no fluid was found. Five months since it was determined to remove it, and Mr. Annandale did so successfully, using the chisel and mallet. The operation being conducted through the oral cavity, no external wound was caused. Mr. Annandale pronounced the case one of ostitis, such as is occasionally met with on the long bones and elsewhere. He is of opinion that it will not recur. The wound healed by first intention, and the result is quite satisfactory. Mr. Watson has prepared a microscopic section of the mass, a portion of which, with the models of case, Mr. Finlayson presented to the Museum. The young lady, aged 25 years, was then introduced, and an interesting comparison instituted between the casts and the present aspect of the face.

He also brought before the notice of the meeting a very remarkable odontome (*in sectio*), which he had been fortunate in receiving on loan for their inspection from Mr. Annandale. The tumour had been removed from the jaw of a young woman in 1873; and as the Professor had published a paper descriptive of the case in the *Edinburgh Medical Journal* for that year, Mr. Finlayson did not feel called on to inquire too particularly of that gentleman into its history; but members present could easily obtain access to the volume, where, he had no doubt, they would obtain all the information necessary regarding it. It might be mentioned, however, that its size and weight are as follows:—

Greatest Length - - - - - -	$1\frac{1}{2}$ inches.
,, Breadth - - - - - -	$1\frac{1}{4}$,,
,, Thickness - - - -	$\frac{7}{8}$ inch.
Weight - - - - - - -	300 grains.

Mr. WILSON exhibited the skull of the Bandicoot of India (*Mus giganteus*), and drew the attention of the members to the enormous development of the sockets of the lower incisors. In the common brown rat (*M. decumanus*), the socket extended as far back as the base of the coronoid process, showing on its buccal surface as a slight tubercle, while in *giganteus* it was continued much further back, and terminated as a strongly-marked process, which projected obliquely upwards and backwards from the buccal surface of the ramus at the anterior part of the base of the condyloid process, from which its free portion was separated by a wide deep groove. He need scarcely say that this species was not to be confounded with the Australian Bandicoots, which belonged to the Eutomophagous Marsupial genus *parameles*. He also exhibited two inferior Maxillae of the common rat—one full grown, the other comparatively young—which, he thought, illustrated very beautifully the growth or development of the jaws. In this genus of Monophyodont Rodents, and in all the allied genera having *rooted* molars, these teeth and their alveoli continued unaltered in size, while the ramus and its processes developed backwards—the sub-alveolar portion of the body downwards, and the anterior portion of the body carrying the scalpriform incisor forwards (this latter tooth steadily increasing in size as the animal aged). The chief change was in the ramus and its appendages, and in the sub-alveolar portion, these being associated with the increasing muscular development of the owner. In man, the development of the jaw backwards is marked by the gradual addition of the permanent molars; while the mesial growth was almost nothing, owing to the junction of the two halves at the symphises during the first year. As to Mr. Colman's theory of the interstitial growth of the Maxillary bones, as enunciated in his recent work on Dental Surgery and Pathology, he thought it based on a too exclusive consideration of human anatomy, or, to speak more correctly, pathology. The same cause which acts in man must also do so in at least the other mammalia; and it would require some ingenuity to square the theory with such facts as the normal non-eruption of certain teeth in some species (the Narwhal, for instance), as well as the common occurrence of certain teeth in the series, which, in many species, never met with their antagonists. As familiar examples of this, he need only cite the front three premolars in the dog, and the first premolars in most of the Carnivora, and in some of the Rodents.

Mr. G. W. Watson exhibited two very interesting pathological specimens of teeth extracted by Mr. D. Marshall, of Stirling, and presented to the Museum—(No. 1). That of a second or third right upper molar, carious on its crown, the general appearance of which is very extraordinary. The whole of the roots are united by cementum, the mass of the tissue being largest at the radical extremities, and exceeding considerably in size that of the crown of the tooth, making its extraction a matter of some difficulty. A surgeon had attempted its removal, but failed; and it was eventually extracted by the donor, after using considerable force. The apex of the tooth is somewhat quadilateral in form, and is hollowed out into a large excavation. Numerous canals perforate the cementum, which has evidently been very vascular. (No. 2), 3rd lower molar: right; to the mesial surface of which is attached, by congenital union, a malformed supernumerary tooth, which had caused great pain by pressing on the adjoining second molar tooth, thus necessitating its removal.—From the *Transactions*.

PASS LISTS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following gentlemen were admitted Licentiates in Dental Surgery on October 28th, viz.:—

W. S. Hedley, M.R.C.S., Army Med. Dep.
H. P. Headdey, Oxford.
C. Browne Mason, Exeter.
Francis Richardson, Derby.
W. A. Turner, Chichester.

One candidate failed.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

Matthew Finlayson, Alloa, was admitted a Licentiate in Denta Surgery on the 20th of October.

FACULTY OF PHYSICANS AND SURGEONS OF GLASGOW.

The following gentlemen were admitted Licentiates in Denta Surgery on October :—

W. M. Adamson, Glasgow.
R. M. Wills, London.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

REGISTRATION.

To the Editor of the Dental Record.

Sir,—Who is to blame for the sad botch and bungle they have made in registration, for I cannot term it anything less? In the first place, all and sundry were registered, whether entitled to it or not; secondly, assistants were registered as in practice; thirdly, anyone is allowed to practise and use the name of Dentist or Dental Surgeon without being registered. This being the case, if I have not been swindled out of two guineas, it looks very much like it. Who is to blame for this gross absurdity?

Yours truly,
BONA FIDE.

[" Bonâ Fide" should inform the executive of the British Dental Association of any one using the designation Dentist or Dental Surgeon without a qualification or being registered as a Dentist.—Ed. D.R.]

The Use of Titles.

To the Editor of the Dental Record.

I am extremely sorry for the South African Dentist who writes in the Dental Record of this month. He says that the Dentist he visited objected, with a high-handed tone, to the abbreviations on his card, and that he has authority, as a qualified Dentist of Ireland, to prosecute any Dentist who should use, I will say the L.D.S. (R.C.S.I.) or Dental Surgeon. As he appears to be blessed with a profound depth of mind and classical education, or he would never have pulled through the *Sine Curriculo* examination, of which he appears to be so proud, I wonder whether this L.D.S. &c., (Ireland) "who has the authority to prosecute," does the same as one in our town, who has been favoured with the same test of his abilities, and after he has made and subscribed to the following declaration, &c.:—I————, of————, "do hereby declare that I am twenty-one years of age, that so long as I hold the Diploma in Dental Surgery of the Royal College of Surgeons of Ireland, I shall not attract business by advertising or any other unbecoming practice, and that I agree that such Diploma shall be cancelled on it being proven." Enclosed is a copy of advertisement which appears in two of our local papers, and which he actually had in the papers at the time he was supposed to be in Dublin for the above purpose. "Shall not advertise or attract business by any unbecoming practice," when such as the following are employed on commission—insurance agents, sewing machine agents, and spectacle hawkers—, and professional cards with the enclosed advertisements thereon distributed indiscriminately. We don't see the doctors doing this sort of thing, and why don't these Dentists with the letters mentioned appended to their names, keep faith with their signature? It is amusing to see the various methods these high-handed men have of advertising. I saw in a newspaper a few weeks ago an L.D.S. of Ireland give his name but did not use Dentist or title, but said he attended professionally at certain towns and had an appointment for six days in the week, supposing that everybody would know him and his profession. If this state of things continues I for one will use the title and run the risk, inasmuch as *Sine Curriculo* declares what he will not do but does it, we inferior animals have not declared anything.

ILEX.

November 23, 1881.

Editorial.

THE SCIENTIFIC METHOD OF THOUGHT.

The members of the Odonto-Chirurgical Society are to be congratulated on receiving, at their last meeting, a Presidential address on a subject of the first importance to such a society. The ennobling tendency of scientific inquiry, the care and time, the quality and quantity of data, the necessary deductions and inductions which the scientific method involves, these were the themes of Dr. Smith's dissertation. At no previous time in the history of the Dental Profession could these questions have been treated with more fitting special application than when recently urged before a representative society of the Science and Art of Dental Surgery. The advancement made in this branch of knowledge has been quite equal to the rapid progress of science generally, and of that the Profession may justly be proud. But while the inquirer seeks for the unknown, and tries to solve the many problems which beset the student of our specialty, he must take the spirit of Dr. Smith's address in his right hand.

Scientific inquiry is the prerogative not of the true student only, but also of the every-day practitioner. In nearly every case a patient, on consulting him about some malady or suffering, details an amount of evidence which is, for the most part, subjective. In addition to this he is, by observation, enabled to gain some objective evidence. Upon one or both of these groups of data does the consultant form a conclusion as to the cause of trouble, and then he treats accordingly. But it not infrequently happens that the subjective and the objective evidence do not coincide or correspond. Pain may be complained of in a sound bicuspid tooth, or in the region of the shoulder; yet the practitioner, guided by anatomical and physiological knowledge, does not extract the tooth or recommend the excision of the joint, but looks at the possibility of the nervous phenomenon, in the one case, arising and being transmitted from a diseased third molar, or, in the other, being reflected from a distant seat of irritation. The analysis of evidence, and the investigation of disease according to physiological principles, are essential to scientific and true practice, as the foregoing simple and familiar examples serve to show. As a necessary sequence Dental Practitioners, in common with all men, are logicians. According to the ability to reason rightly, and the correctnesss of the reasoning brought to bear upon each case, will an accurate diagnosis be arrived at. In short, he who conducts this class of investigation according to the light and truths of physiology and the strict principles of logic, observing the precautions which the scientific method demands, will be the successful man.

ANNOTATION.

To add to the convenience of forming the volumes of the Dental Record, it has been decided to complete Vol. I. with this Number. On the second of January, 1882, will be issued Number 1 of Vol. II.

GOSSIP.

Mr. Thomas Wormald, L.D.S.I., has been appointed Dental Surgeon to the Oldham Infirmary.

The Queen has conferred the honour of knighthood upon Mr. Erasmus Wilson, President of the Royal College of Surgeons.

The annual dinnner of the past and present students of the Dental Hospital of London will be held on Friday, December the 2nd, at St. James's Hall, Regent Street; Edwin Saunders, Esq., F.R.C.S., in the Chair.

Mr. Gaddes, L.D.S.Eng. and Edin., has been appointed Dental Surgeon to the National Dental Hospital, *vice* Mr. H. T. K. Kempton, L.D.S.Eng., resigned. Mr. Alfred Smith, L.D.S.Eng., and Mr. G. D. Curnock, L.D.S.Eng., have been appointed Assistant Dental Surgeons to the same institution.

Mr. David Hepburn, L.D.S.Eng., has been appointed Dental Surgeon to the Dental Hospital of London, *vice* Mr. Chas. J. Fox, M.R.C.S., L.D.S.Eng., resigned; and Mr. Trueman, M.R.C.S., L.D.S. Eng., has been appointed Assistant Dental Surgeon to the same charity.

Oysters are laid down in beds in Dublin Bay, on the north side of which the contents of large sewers are discharged. The liquid of some of the oysters has been found to have a fœtid and unmistakable odour of sewage, and were found to swarm with micrococci and other low organisms.

Dr. McIlhenny has collected a number of fossils and other specimens which quite mystify the theories of visiting geologists. At Petite Ause the bones of the mastodon are found within fifteen feet of the surface, not far from which are also fragments of pottery and baskets of wild cane in perfect preservation, and of the same patterns as those in use among the Têche Indians of the present day.

The hunting of alligators in Florida is carried on to such an extent as to threaten an extirpation of the species there. Nothing is used except the skins on the belly and legs. The rough scaly plates on the back are rejected. The heads are cut off, and buried for a few days, till the tusks can be detached. It has been stated that one person had lately collected alligators' teeth to the amount of three hundred and fifty pounds.

The Edinburgh Dental Hospital and School.—The session opened on November 1st. The number of students attending the hospital practice and classes is very satisfactory. Eleven young men are on the dean's roll, six of these being new entrants. The number of those who have passed, or are going in for the preliminary examination with the intention of joining the school, is very encouraging, and bodes well for the continued prosperity of this vigorous and well conducted institution.

In the *Chemical News* of October 28th, page 208, is a Note from the Laboratory of the University of Virginia, of physiological interest. Mrs. Hayward, of Charlestown, South Carolina, by "Researches on the Presence of Ammonia in Human Saliva," shows that mixed saliva contains constant traces of ammonia not due to expired products of respiration. The amount, approximately estimated, but not quantitively determined, is fairly uniform in different individuals and at various times. Eliminating successively pairs of glands, by clamping their ducts, the submaxillary secretion was found to be the principal, if not the only, source of the ammonia.

Dr. S. Gibbon, Medical Officer of Health for the Holborn District, London, in his report for the last year, referring to longevity among the Jews, says that there is no doubt that the Jew's life in London is, on the average, worth twice as many years as a Christian's. The Hebrews of the metropolis are notoriously exempt from tubercular and scrofula taint. It is very rare that one meets with pulmonary consumption among them. The Medical Officer of one of their large schools has also remarked that their children do not die in anything like the same ratio as Gentile children. In the district of Whitechapel the Medical Officer of Health has reported that on the north side of High Street, occupied by the Jews, the average death-rate is twenty per thousand, while on the south side, occupied by English and Irish Gentiles, it is forty-three per thousand.

In the last number of the *Proceedings* of the Berlin Geographical Society Dr. G. Fritsch writes:—There are problems connected with the evolution of man, and with his present distribution over the earth's surface, the solution of which depends upon a more exact knowledge of the former distribution of land and water, especially in the Tertiary period. The gap that separates man from any of the living anthropoids is profound; but it may possibly be bridged over, or contracted to smaller proportions, by the future discovery of fossil remains in the tropical regions, where the race most probably originated. Should these regions fail ultimately to yield the connecting links, then the conclusion would be strengthened that the evolution of mankind took place in some now submerged land, as, for instance, in the Lemuria of the Indian Ocean, or in the vast continent of which the Pacific Islands may be regarded as the fragmentary remains. In the latter case the problem would remain practically insoluble, and the descent of men from some now extinct anthropoid forms would have to be regarded as at most an assumption incapable of strict demonstration.

INTERCOMMUNICATIONS.

QUESTIONS.

(7.) STUDENT.—I have had a controversy as to the alveolo dental membrane with several friends; some say it is one thing, some another. On consulting a very large number of dental text-books I find no reference made to it. If you would say definitely what it is you would confer a favour on many besides myself I have little doubt?

(8.) DENTAL STUDENT.—As I am anxious to study during my spare time before completing my articles, may I ask if you will inform me in the next issue of the DENTAL RECORD what books will further me most before entering college?

ANSWERS.

(8.) DENTAL STUDENT.—If not exempt from, and have not passed, the preliminary examination (see page 192, September Number) you must first pass it. Tomes' "Dental Anatomy" and Salter's or Coleman's "Dental Surgery." After those books you may invest in Gray's "Anatomy," Druit's "Surgeon's Vade Mecum," &c.—ED.

Communications.

Communications have been received from—Walter H. Coffin, London; J. R. Gurner, Adelaide; James Robertson, Edinburgh; Henry J. Pitman, London; W. Bowman Macleod, Edinburgh; Dr. J. Smith, Edinburgh; H. François, London; G. Norman, Hammersmith; F. A. Huet, Manchester; Willoughby G. Weiss, London; A. Vickery, Coventry; Dr. E. Taillebois, Paris; George Ward, London; G. W. Parkinson, London; J. S. Cobb, Yarmouth; W. J. Pidgeon, Rouen; Frank Comer, Torquay; Thomas Wormald, Oldham; J. R. Brownlie, Glasgow; E. J. Wallis, Weymouth; T. D. Miller, Birmingham; M. Finlayson, Edinburgh; J. S. Amoore, London; Alfred Coleman, Streatham.

Books, &c., Received.

"Pharmaceutical Journal." "The Specialist." "Dental Register." "Dental Advertiser." "Ohio State Journal of Dental Science." "Sanitary Record." "Dental Cosmos." "L'Odontologie." "Journal of British Dental Association."

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The Editor here begs to thank also the following gentlemen for their communications and kindness:—

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INDEX.

PAGE

Acute-Glossitis, On some of the Diseases liable to be Mistaken for ... 216
Adhesive Gold Filling, Some Remarks on ... 244
After Thirty-eight Years' Practice ... 203
Administration of Anæthetics at Dental Hospital of London 78
Alveolar Abscess ... 20, 82
Annotations ... 46, 92
Antral Abscess ... 86
Apprenticeship and the Preliminary ... 188
Arrestation of Infusorial Life ... 171
A Generalized Treatment of Irregularities ... 112
A New and Original Method of Treating Exposed Pulps ... 197
A Reply ... 97

Backing Teeth ... 98
Bi-lateral Alveolar Abscess ... 20
Books, Reviews of ... 23, 54, 200, 250
British Dental Association ... 63
British Association, The ... 160
Buccal Tuberculosis ... 257

Candidate, Teacher, Examiner ... 234
Case of Odontome Odontoplastique ... 198
Cases of Facial Neuralgia ... 4
Caries, Predisposing Causes of ... 83
Celluloid and its Manipulation ... 17
Civilization in its Relation to Increasing Degeneracy of Teeth 82
Clinical and Mechanical Demonstrations ... 88
Congress and the Specialty, The ... 91
Continuous Gum-Work ... 124
Correspondence—
  Correction ... 91, 187
  Medical Congress ... 188
  National Dental Hospital ... 44
  Preliminary Examination ... 188
  Thoughts, Comparisons, Reflections ... 232
  United we Stand—Divided we Fall ... 44
  Use of Titles ... 233
Contributors, List of ... 284
Cylinder Filling ... 205

Death of a Dentist from Morphia 226
Deaths from Swallowing Artificial Teeth 31
Dental Ethics 149
Dental Hospital of London Medical School 56
Dental Hospital Reports 43, 231
Dental Manufacturing Company, The 184
Dental Surgery in the Army 120
Dental Forceps 186
Dental Education 80
,, ,, Provincial 222
Discoveries of Past Half Century 163

Eastern Counties Dental Association 237
Educational Section 132
Editorial—
  Apprenticeship and the Preliminary 188
  Candidate, Teacher, Examiner 234
  Genesis 45
  Suggestions to Students 132
  The Congress and the Specialty 91
Erosion or Decay by Denudation 85
Ethics, Dental 149
Examination Papers 41, 229
Experiments on the Action of Agents used for Devitilasation of Pulp 78
Exemption of Dentists from Duties of Citizenship 208

Gaseous Fuel 156
Genesis 45
Generalized Treatment of Irregularities, A 112
Gleanings from Societies 223
Gossip 46, 93, 130, 189, 235, 281

Hammond's Wire Splint 209
Hospital Reports 43, 231

Impression Tray 187
International Medical Congress 36, 70
,, ,, and Sanitary Exhibition 41, 130
Investigation into the Effects of Organisms upon the Teeth 81
Intercommunications—
  Colouring Impression Compo 192
  Effect of Mercury 144
  Solvent for Vulcanite 144, 192

Thermometers 144, 192
Ulceration of Face 48, 192
Waste Filling 48
Irregularities, A Generalized Treatment of 112
,, Causes of 84

Jaundice 158

Lecture on Operative Dental Surgery 8
List of Contributors 284
Lusus Naturæ 195

Manipulation, Celluloid and its 17
Micro-Organisms to Inflammation, Relation of 210

Necrosis 193
,, Operation for 207
New Inventions—
An Injector Press 227
Dental Forceps 186
Impression Tray 187
The Remora 227
Obituary 225, 226, 230
Odonto-Chirurgical Society 223
Odontological Society 32, 222
Odontome Odontoplastique 198, 199
On the Re-insertion of Teeth 241
On the Reproduction of Bone 79
On the Scientific Status of Medicine 74
On some of the Conditions liable to be Mistaken for Acute Glossitis 216
Operation for Necrosis 207
Operative Dental Surgery, Lecture on 8
Origin and Treatment of Certain Irregularities of the Teeth .. 84
Oxychloride and Cotton Wool Filling 147

Paralysis of Sensory Nerves from Extraction of Wisdom Tooth 100
Pass Lists 90
Parotid Cyst 223
Premature Wasting of Alveoli 79
Plan for Work-Room Book 148
Ponder Long and Late 90
Preface 3
Predisposing Causes of Caries 83

Progress of Odontology, Review of 252
Provincial Dental Education 222

Reading General Dispensary 231
Reflex Pain, Case of................................ 249
Relation of Micro-Organisms to Inflammation............. 210
Replantation 75, 101, 241
Replanting Teeth 52
Reply, A 97
Review of the Progress of Odontology 252
Reviews of Books 20, 54, 200, 203, 250
Rise and Progress of Palæontology 162

Scientific Method of Thought, The 280
Scientific Status of Medicine, On the 74
Some Remarks on Adhesive Gold Filling. 244
Spindle-cell Sarcoma 223
Suggestions to Students 132
Suicide of an L.D.S.Eng....................... ... 225
Swallowing Artificial Teeth, Deaths from 31
Syphilitic and Cancerous Ulceration of Tongue 26
,, Nicrosio, Six Cases of 254

Teeth, Swallowing Artificial 31
,, Replanting 52, 101
,, Backing 98
,, Treatment of Irregularities of..................... 112
,, Investigation into the Effects of Organisms upon 81
The Dental Manufacturing Company 184
The Profession As It Is 247
The Scientific Method of Thought 280
The Tendinous Intersection of Digastric 150, 232
Thoughts, Comparisons, Reflections................... 49, 145
The Congress and the Specialty......................... 91
Tongue, Ulceration of 26, 224

Vivisection 172

Western Counties Dental Association 65

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